FRY'S PURE CONCENTRATED COCOA.

THE PRACTICAL TEACHER

With which is incorporated

The Practical Teacher's Art Monthly

August 1909

THOMAS NELSON & SONS LONDON
EDINBURGH·DUBLIN
& NEW YORK

VOL. XXX No. 2

PRICE 6D.

ENGINEERING WONDERS
OF THE WORLD.

Edited by

ARCHIBALD WILLIAMS,

Cycling and Photographic Editor of "The Captain."

To be completed in 20 Fortnightly Parts.

PART 7. **PART 7.**

GRAND SPECIAL NAVAL NUMBER

NOW READY.

72 Pages. Profusely Illustrated.

The series of articles contained in this Part will teach a great deal about Warships of all types.

The articles are from the pens of experts—Mr. A. G. HOOD, Editor of *The Shipbuilder*, and Mr. ALAN H. BURGOYNE, Editor of the *Navy League Annual*, and joint author of "Trafalgar Refought."

The following are a few of the **MANY** subjects treated:

- The Manufacture of Armour Plates and Big Guns.
- How Armour and Guns are disposed on a Battleship.
- Methods of Transferring Heavy Ammunition from Magazine to Gun.
- A Trial Trip on a "Destroyer."
- The Wonderful Automatic Steering Mechanism of a Torpedo.
- The Internal Mechanism of a Submarine.
- What happens on a Battleship during a Naval Action.
- What Warships of the future will be like.

7d Net.

26,000 Words of Letterpress.
66 Illustrations.
A Splendid Coloured Plate.

7d Net.

THOMAS NELSON & SONS, 35 Paternoster Row, LONDON, E.C.

And at all Bookstalls, Booksellers, and Newsagents.

THE PRACTICAL TEACHER

With which is incorporated

THE PRACTICAL TEACHER'S ART MONTHLY

Vol. XXX. No. 2. AUGUST, 1909. Price 6d.

Notices to Correspondents and Subscribers.

"The Practical Teacher" may be ordered of any Newsagent or Bookseller, or at any Bookstall, in the United Kingdom or in the Colonies. Supplies are sent monthly to the chief towns in Australasia, South Africa, and India.

London Office: 35 and 36 Paternoster Row.
Edinburgh Office: Parkside Works.
Dublin Office: 17 Talbot Street.
New York Office: 37 East 18th Street.
Paris: W. H. Smith and Son, 248 Rue de Rivoli.

Subscribers may obtain "The Practical Teacher," post free, from the Publishers at the following terms:—

United Kingdom, Continent, Colonies, and United States } 12 Months, 8/- 6 Months, 4/-

All literary communications should be addressed to the Editor, Office of "The Practical Teacher," 35 and 36 Paternoster Row, London, E.C.

Remittances, Cheques, Post-Office Orders, etc., should be made payable to Thomas Nelson and Sons. Advertisement rates on application.

CONTENTS.

An Educational Experiment. By Mary S. Jacob 58

Mr. Jackson's Report on Boy Labour. By an Inspector of Schools 59

Geography Notes Up-to-date. By E. R. Wethey, M.A., F.R.G.S.—Examination Papers—Politics and Geography—Geography and Politics—The Empire Up-to-date . . . 60

A Book for Alpine Climbers . . . 63

The English Association 64

Geography in the Lower Standards. A Suggested Revision. By A. J. Ker . . 65

Japanese Pictorial Art. By Ken Hoshino . 66

Reading in Evening Schools. By T. Shopland, B.A. 67

On Telling a Story to Children. By Amy Barter, L.L.A. 69

Our Cookery Column. By Rosamond Candy 71

Our Art and Handwork Section—
Painters and Pictures. By W. E. Sparkes.—IX. George Clausen, R.A.—X. L. Campbell Taylor 73
Drawing in Public Schools. By W. Ryle Smith . 78
The History Lesson and Drawing. By W. H. Elgar 83
Honours Page 88

Notes and Suggestions on the Teaching of Experimental Science, Mathematics, and Drawing. By C. Hamilton 89

A Correlated Scheme based upon Æsop's Fables 93

Nature Study in the Metropolis . . . 94

Nature Study. Some Criticisms and a Warning. By W. Francis Rankine 95

Modern Science Notes. By J. G. McIntosh, B.Sc.—A New Piece of Apparatus for Demonstrating Reflection and Refraction—The Colouring of Plants—Deep Sea Sounding—Hysteresis Tests 96

Secondary Education in Scotland. By R. J. Dickson, M.A. 98

Teachers as Actors: A Sketch . . . 100

Riddles. Words from "Songs of the Nursery." Music by Thos. J. Hewitt 102

French Prize Competition 103

Our Query Column—
Replies to Vera—Maths—Rollo—Atherton Moor. 104

A First Lesson in Simple Equations. By Percy H. Wykes, M.A. 106

Nature Study in Glasgow. By James Knight, M.A., D.Sc. 107

The Teaching of History 107

Educational Gleanings. Questions and Answers. By T. G. Tibbey, B.A. . . . 108

The Advance of Physical Education. By Herbert Leather 109

The Work of the London Children's Care Committees. By Clara E. Grant 110

Medical Inspection in Kent. By E. J. Cooke 111

Correspondence 113

The Editor's Bookshelf—
Herbert Spencer—the Man 114
The New Botany 115
An Unconventional History 116

AN EDUCATIONAL EXPERIMENT.

BY MARY S. JACOB.

SINCE every boy and girl in England is compulsorily sent to school, and since the poorest of them may receive an education under the same conditions as many children in far more fortunate circumstances of life, a mixture of classes must of necessity arise among children of the same capacity.

Although equality may be an ideal impossible of realisation, to promote fraternity in the school should be the constant endeavour of every teacher.

This in itself presents certain difficulties; but if it is considered worth while to deal with this question at all, it is necessary to approach it in as practical a manner as possible. It will therefore be found advisable at the outset to teach the children to understand that they are partners in building up a great Empire, and that what is required from them is not only "kindly talking," but fraternal action, co-operation, and good fellowship.

To carry this teaching on a step further it will become a necessity to attack the "external" distinctions which are found so glaringly apparent in every school of this grade, and which "stamp" the child to a very considerable degree in the eyes of its companions. Although no possible ill-feeling may be openly discovered, and every kindness and consideration shown to the poorer and neglected children who form a certain percentage of the scholars, it is certain that such children instinctively feel most sensitively conscious of their shortcomings, and are painfully aware that they are pitiful objects, to say the least, in the eyes of many of the better-to-do girls belonging to the school.

BEFORE ADOPTING THE PINAFORE-OVERALLS.

It was therefore with the definite aim of promoting equality of dress, raising the standard of cleanliness, and at the same time developing a spirit of patriotism and fraternity amongst the children, that the following experiment was devised and carried out in an elementary girls' school. It sought to encourage the poverty-stricken child—the neglected little specimen of a thriftless home—to take pains with her general personal appearance, and to feel the stimulus of an ambition and hopefulness too often crushed and annihilated amid the sordid surroundings of a daily struggle for existence. With this object in view it was decided to dress the girls alike in pinafore-overalls when once inside the school walls, and thus to place them one and all in an environment of neatness and order.

The brief narration of the manner in which this experiment was worked out and introduced into the school in question may possibly be of interest. For it is certain that progress is often retarded and serious loss incurred in all walks of life partly from conventional inertia and timidity in trying anything new, and partly from waste involved in unrecorded experiments. My hope is that this account may induce some of my readers to adopt this scheme and improve upon it.

It was found of the first importance in providing an "outfit" of pinafore-overalls that they should be the school property, and purchased from funds collected under the same auspices. In this case they were bought out of the profits of a concert and whist drive. The necessity for this can very easily be understood. If it were otherwise, the strain of continually making them would be a grievous burden upon all concerned. It is hardly necessary to observe that in the case of the better-to-do parents, who like to provide and make them for their children, it is certainly best to accept their offer. But such generosity is rare in a poor school.

Next comes the question of "cutting out" and "making." This, of course, is a serious consideration, and no light undertaking. It has, however, been proved that it is quite possible to complete them by the senior classes of the school in a comparatively short period. It makes most excellent practice for the girls, who thereby become expert machinists, and take great pride in turning them out quickly and well. The pinafore-overalls in question were made from a simple pattern, with a lined yoke and sleeves gathered into a wristband. They were finished with a tucker of lace round the neck. About three hundred were completed as a first instalment, and others are now being made in order to provide a second when necessary to have them washed.

This brings another problem to be faced, and one of serious importance—that of "washing" these garments. In considering this question it is necessary to remember that as the pinafore-overalls hang up after school on the child's peg and are never worn at home, they do not very readily become soiled. It is, moreover, found that the parents of the children—even the very poorest—take an extraordinary pride in washing them. In the case of a few disreputable homes to which it would not be wise to send any school property, arrangements have been made for these to be washed by the girls during the school laundry lessons.

Various other details in connection with this experiment had to be considered at the outset. For some time it was difficult to decide whether the pinafore-overalls should be of one prevailing colour, or whether they would be more satisfactory if made in many different hues. But as it was found essential to guard against any suspicion of a "uniform," and also being

BRITISH MUSEUM

mindful of the fact that to make a child look attractive it is necessary to study its hair and complexion, it was finally determined to buy good washing print, and to choose bright and varied colours. The result is quite satisfactory, and when dressed in them many children are completely metamorphosed.

Before concluding, it is necessary to touch upon a detail which on no consideration can be overlooked. In all matters of this kind connected with the child it is indispensable to obtain the co-operation of the parents. Carefully-worded notes were sent round to each home, and these secured a favourable reception. No further difficulty was experienced in the adoption of the scheme. The pretty colours of the prints were so admired that even the older girls were anxious to array themselves, and without exception took great pride and pleasure in donning these attractive garments.

Needless to remark, the task of providing a school "outfit" of this description is not an easy one. It requires an unusual amount of energy and determination. Ideals worth living for generally do. The question may well be asked whether this experiment has proved successful and worth the trouble and pains expended upon it. The answer is a satisfactory one. Undoubtedly it has repaid all effort and been an unqualified success. Its educational value is considerable, quite apart from any practical results; for it is calculated to teach the child to think about the necessity for neatness and cleanliness of person in its daily work—a truism so often ostentatiously neglected by the working classes in England. Besides, it is hoped that something of what is taught may get through to the mother; and something may also remain in the child's mind, and prove of use in the future by raising the standard of home life.

After Adopting the Pinafore-Overalls.

The objection which may be naturally raised of attempting to place "a veneer" upon an untidy appearance by a clean exterior calculated to hide all deficiencies is found on application to be not so open to criticism as might well be imagined. In many cases the poor child is led to make efforts to mend its clothes and pay attention to personal details which before were absolutely neglected.

MR. JACKSON'S REPORT ON BOY LABOUR.

BY AN INSPECTOR OF SCHOOLS.

SINCE the last article on the van boy was written, Mr. Cyril Jackson's report on boy labour has been published. The commissioners, in the course of their inquiry, were so strongly impressed with the extent to which boys leaving the elementary schools are drafted into blind-alley work that, with a view to getting more exact information, they appointed Mr. Cyril Jackson, formerly Director of Education, West Australia, ex-Chief Inspector of Schools, Board of Education, etc., at present chairman of the London Education Committee, "to inquire and report on the main occupations followed by boys on leaving public elementary schools in certain typical towns, the opportunities of promotion in such occupations or of training for other occupations, and the extent to which such boys subsequently obtain regular employment (skilled or unskilled) as adults." This sub-report, which is issued as Appendix, Volume XX., to the Poor Law Report, contains a mass of evidence within its 230 pp., and can be bought for 3s. 6d. from Wyman and Sons. It will be found invaluable to all who are interested in the sociological side of the education problem, and is a marvellous compilation, considering the fact that only eighty-five days were allowed Mr. Jackson for carrying out his investigation. One feels as one reads it that Mr. Jackson's signal services should, if possible, be again requisitioned, and that he should be given full powers and plenty of time to complete a work which he is so eminently fitted to do. It is evident that he has been seriously handicapped both as regards time and also from lack of co-operation on the part of employers and the boys themselves:—

(*a*) Less than 1,000 of the 4,700 forms issued to employers were filled in.

(*b*) Only 4,000 of the 12,000 industrial biography forms issued to youths were returned. ("Lads are always suspicious of what they regard as prying into their affairs, and the heading 'Poor Law Commission' was also frequently objected to.")

In spite of almost insuperable difficulties, Mr. Jackson has managed to diagnose the boy-labour evil, and to clearly indicate most of the main causes thereof.

It will only be possible to refer to a few of the leading features dealt with.

In the large distributive centres we saw that a heavy percentage of boys become errand and van boys—London (40 per cent.), Bristol (35 per cent.), Liverpool (30 per cent.). In Oldham, a cotton town where they want the boys for spinning, the people do their own carrying (errand boys, etc., 1 per cent.).

By carefully comparing the census with Home Office and other statistics, we find that as regards factories and workshops the most marked excesses of boys are in hemp, jute, worsted, etc. For example:—

TOTAL POPULATION, MALES 1901.

(Age Group Ratios, 14 to 18 years.)

Census	13·5.	Jute	27.
Worsted	21·1.	Glass	25.
Hemp	25.	Printing	21.

How this parasitic use of boy labour may tell against progress is shown thus :—

"In one large shop it appears that directly, by increased skill, the men raised their wages, the employer reduced the amount per piece, and then the quickest workmen actually slowed down to prevent such reductions and to help their slower mates. Cheap boy-labour, by hampering the development of the best men, is an enormous loss to the community, and, moreover, it may prevent the adoption of new inventions, and so "stands in the way of the most advantageous distribution of the nation's industry, and debars its capital, brains, and manual labour from being in the aggregate as productive as they otherwise would be." The report shows that the post office is one of the least promising occupations into which a boy can enter. The fact that a public department which ought to be a model employer is really one of the worst offenders in this matter caused the investigator to treat the telegraph messengers exhaustively. Moreover, as Mr. Jackson says, "with a stroke of the pen the ages of admission to and dismissal from the service could be reduced;" and if there was some increased cost thereby, public opinion would support the endeavour to abolish this abuse. An adjustment of numbers in towns could be made so that all the boys in the town except the definitely unsatisfactory ones could be absorbed as telegraphists, sorters, clerks, and postmen, instead of the large majority being turned adrift at sixteen, as happens now. It is interesting to read the opinion of Mr. C. E. B. Russell that the boys of Manchester are beginning to find out that to aim at the black coat occupation is a mistake.

The employment in offices is often wholly unprogressive work, and in *small* offices presents subtle evils from which other forms of irregular work are free. Often the boy has nothing to do but "watch" the office, reading the while trashy papers. The now prominent question of declericalising education will help to settle this phase.

The worst form of shop work is said to be that of lather boy in barbers' shops, owing to the long hours (fifteen hours on Saturdays, and often + six to eight on Sundays), insanitary conditions, and immoral environment (many of these shops are gambling dens).

Can the errand boy be replaced? The increased use of the telephone from room to room and from place to place, and the organisation of co-operative carrying, would lessen the number required.

A clever chart (page 44) shows that the van boy's berth is a very low grade one, and that very few boys who begin as such get into skilled trades—a far lower percentage even than errand boys.

Street-selling is, however, the most demoralising of all these casual jobs. Mr. Russell thinks the majority of Manchester street-sellers die under thirty years of age. Mr. Jackson advocates the entire clearance of the whole gang from the streets. "If the papers must be sold at the street corners, they should be sold at stalls, as in Paris; matches can be obtained in any part of a town from the ubiquitous tobacconist." The life of the street trader is a continual gamble, unredeemed by any steady work.

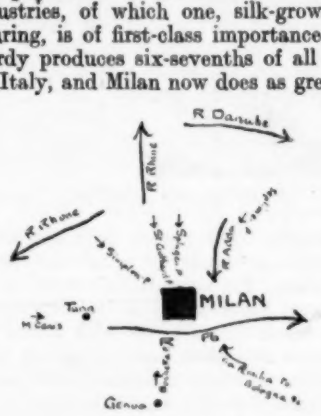
Mr. Jackson sums up the situation in these terse remarks: "The work of an errand boy or a telegraph messenger is bad for the boy; so is the work of a boy in a warehouse or factory who is employed to fasten labels to bottles, to fill packets of tea, or the like. It is not so much a question of a skilled trade not being taught as of work which is deteriorating, absorbing the years of the boy's life when he most needs *educational expansion in the widest sense.* At present we work in a vicious circle—the low wage of the unskilled parent may be all he is worth, because he has been stunted as a boy; while his ruin as a boy was brought about by the low wage of his parents, which made them place him prematurely in deteriorating work in order to earn the few shillings needed to swell the family income." Speaking of the suggested remedies, he puts the case for a longer education very forcibly thus: "It can hardly be seriously contended that the boy of the working man is really more fit for life than the public school-boy at the age of fourteen, who is admittedly unready at that age." "If it is urged that further time for schooling is commercially impossible, it must be remembered that our great trade rivals—Germany and the United States—have compulsory continuation schools or a higher exemption age." In conclusion, he refers to another possible development. "Compulsory military service is now being discussed. In the great Continental nations military service is the natural period of break in the life of the young man. He goes into the army a *boy*, and comes out a man. *Our* army is unfortunately recruited to a large extent from the industrial failures. The citizen army would not be the industrial leavings, but the whole population fit to bear arms."

GEOGRAPHY NOTES UP-TO-DATE.

BY E. R. WETHEY, M.A., F.R.G.S.

EXAMINATION PAPERS.—(*Continued.*)

MILAN.—If ever a city was made by its "geography," Milan is. (1) It stands in the centre of a fertile plain, and (2) great trade routes (see diagram) converge on to it from all sides. The fertility of the plain ensured (3) a dense population in the district, and produced (4) many industries, of which one, silk-growing and silk manufacturing, is of first-class importance. The Plain of Lombardy produces six-sevenths of all the raw silk output of Italy, and Milan now does as great a trade in



MILAN. Converging Trade-routes

raw and thrown silk as its rival Lyons. Moreover (5) iron in the district led to the great industry of armour-making, for which Milan was notorious in the Middle Ages, and accounts for its fame in cutlery at the present day. Finally, to all these natural advantages must be added (6) a peculiarly modern one. Milan is near enough to water-power to appear in the forefront of up-to-date Italian cities, and to-day the city's electric cars are run by power from the Paderno works on the Adda.

As a great distributing centre its commercial importance is as high as that of any city in Southern Europe. Note in the diagram the "Passes" which Milan commands. By the Simplon it came in touch with the Rhone valley; by the St. Gothard and Splügen, with the Rhine; and by the Septimer, with the Danube—all great trade routes with Central Europe. The recent piercing of some of these passes with railway tunnels (St. Gothard in 1883, and Simplon in 1906) has enhanced the city's importance. It stood, too, on the direct east and west line of the Po route, in close connection therefore with Tunis and the Mont Cenis on one side, and Venice and the Adriatic on the other. To the south-east ran the old Via Æmilia straight through the important cities of the north-east end of peninsular Italy; while directly south lay the Bocchetta Pass over the Apennines, affording easy communication with Genoa. The latter town, indeed, grew rich itself largely in supplying such places as Milan and Turin with sea-borne goods. Several modern express routes from London *viâ* the St. Gothard make Milan their objective—such, for example, as those by way of Calais, Ostend, Flushing, and the Hook of Holland. Return cargoes are never wanting in the form of Italian eggs, wines, silks, and the dairy products of the Milanese. Of the last-named, cheese is worth noting. Both Parmesan and Gorgonzola are produced in the vicinity—another tribute to the qualities of the alluvial soil washed down by the Po and Ticino, the Olona and Adda.

Prague.—The natural advantages of Prague recall those of Milan. It is (1) the centre of what has always been a populous district; (2) it has good water communications, especially to the north (head of navigation on the Moldau for large boats); (3) to the south it stands just where the steeper ascent of the south Bohemian plateau begins; (4) it is the meeting-place of roads coming from gaps in the mountains east and west, north and south; (5) it is in close touch with two great mineral deposits—coal, to the north-west of the town, and iron in the Ore mountains. But the diagram shows

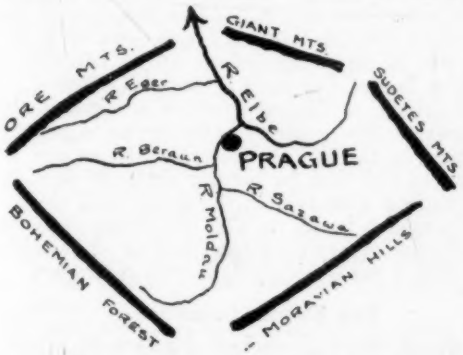


Diagram explaining site of Prague,—
Surrounding mountains, convergent rivers.

the origin of Prague quite clearly. Mountains surrounding, rivers convergent, point to a natural centre where, if there is to be an important town at all, it is bound to spring up. This natural centre in Bohemia is Prague. And there it stands—in the lowest and most fertile part of the country, just where the rivers collect together before pouring out north to the German plain through the gap of the "Saxon Switzerland."

These natural advantages account for its commercial importance. One fact alone proves it; it is the junction of no less than seven railways, which explains one of its most recent industrial developments—namely, the building of engines and cars. For the rest, it is the chief market of Austrian sugar—again a direct result of its command of the Elbe navigation (see diagram of Hamburg's "Hinterland"). It has great shipping interests, and it attracts to itself various industries dependent on the converging valleys, such as brewing from the hops and barley of the Beraun, and metal work and pottery from the silver and kaolin of the Eger. One result of this universal enterprise, taken in conjunction with the well-known rivalry of the two races in Bohemia—Czech and German—is a great development of education in Prague. Bilingual universities and schools, and plenty of them, react in their turn on the commercial activity of the citizens.

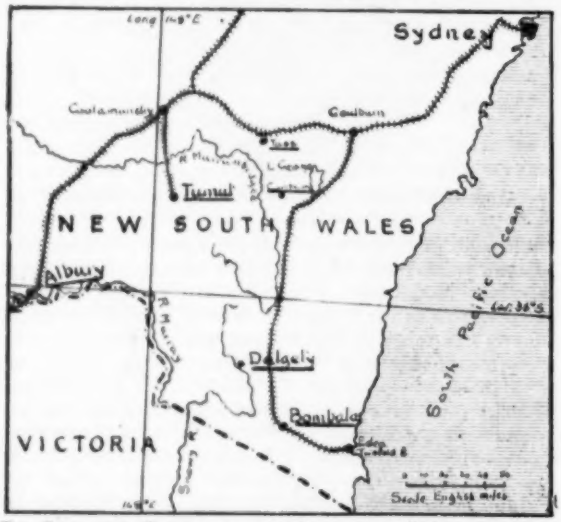
Salonica.—Two great routes are marked out by Nature across the Balkan Peninsula, and are traversed to-day by the two chief railways of the Turkish Empire. At the end of one stands Constantinople, at the end of the other Salonica. These routes are for the most part

THE DIAGONAL FURROW OF THE BALKAN PENINSULA
Distance from Belgrade to Salonica direct, 300 miles

three river valleys cut out from the mass of mountainous plateau which tails off in the east into the Balkan and Rhodope Mountains. Beginning at Belgrade, what is often known as the "diagonal furrow" of the peninsula follows the valley of the Morava, and forking into two at its confluence with the Nishava, ends on the Ægean with the Vardar and the Maritsa. A fair harbour and a fertile soil complete the conditions which evolved Salonica at the end of the western fork of the furrow. That, as the map shows, it is not on the river itself is the fault of the low-lying marshes through which the Vardar eventually reaches the sea. The commercial importance of the town is of old standing, for the Vardar valley was a connecting link between Rome and the East, and long before the Turks overran the land Salonica's fair or market was attended by merchants from far and wide. To-day the railway is responsible for much of its development. The busy quarter is naturally on the north-west side of the town, which acts as the chief importing and exporting seaport for all Macedonia and a part of Albania. Grain, raw silk, wool, hides and skins, tobacco, are typical exports, and pay for the various manufactured goods which head the import list. There are local manufactures, too, notably flour mills and leather establishments. A proposal often mooted in recent years to make Salonica take the place formerly monopolised by Brindisi, and act as an important link in the chain of the overland route to India and the East—that is, *viâ* Port Said—shows as well as anything the importance of its position. It is, in fact, at the present time the terminus of the shortest railway route from London to Egypt.

Politics and Geography.

As a rule towns grow up and develop where they are through various geographical conditions and advantages. There are exceptions, however, to every rule, and amongst them it appears necessary now to class the modern type of capital city. The difficulty of deciding on the new capital of All-British South Africa is as nothing to that which for eight years has agitated our other great southern Commonwealth, though the underlying cause is the same. Inter-state jealousies—politics, in a word—prevent Australia from getting further than a suggestion as to its new capital every two or three years. What is meat to Victoria is poison to New South Wales, and *vice versâ*. All that is settled is that the new capital shall be in New South Wales, but at least a hundred miles away from Sydney; that it shall have a hundred square miles of territory; and that all Crown lands in this territory shall be a free gift from New South Wales. When the Federation was first accomplished—namely, in 1901—there was a sort of unofficial suggestion that Albury would make an ideal capital. Nothing came of it, save the appointment of a Commission to go into the whole matter and report. The Commission recommended Tumut, and two years after—1903, for Commissions are the same all the world over, and their



The Suggested Capitals of the Australian Commonwealth.

effects are never hurried—the House of Representatives strongly recommended Tumut. It has an excellent climate, is the centre of a well-known agricultural district, has good communications, and is far removed from any danger of a naval attack. (Even at that period there seems to have been a *Dreadnought* spirit abroad!) Be that as it may, the Senate would have none of Tumut, and suggested Bombala, probably—such is contrariness!—because it was nearer the sea, and had an independent access to the danger zone by way of Twofold Bay. However, nothing transpired. In the following year—1904—*both* Houses suggested Dalgety, on the Snowy River; and some recent geography text-books, imagining that a suggestion from both Houses was tantamount to a decision, have boldly printed Dalgety as the capital of Australia. Their imaginings are vain. Objections were raised to Dalgety, and again Australia waited for more suggestions. She waited five years, and once more a new capital is to the front. This time it is Canberra, a small place in the south of the new proposed Federal district which is to extend from Yass eastwards to Lake George, and southwards nearly to Queanbeyan. There matters rest at present. How politics will intervene lies on the knees of the gods; it seems odds though against Canberra, or any other part of the "Yass district." Meanwhile Melbourne acts as the Federal capital, what time Sydney feels for the future.

Geography and Politics.

But if in one part of the Empire politics appear to control geography, in another the latter gets ample revenge. One can adduce few better examples of the "human note" in geography than the curious control exercised by the science in the organisation of Newfoundland politics. As every school debating society knows, a constitutional point of importance arose in our oldest colony last March. The opposing political parties had come out exactly equal—eighteen each in a House of thirty-six—in the General Election of last November. The "Bondite" eighteen—Sir Robert Bond was the reigning Prime Minister—decided to carry on the Government on the off-chance that one of the Opposition or Morrisites (Sir Edward Morris is the leader) would, in the exercise of his calling as a sealing captain, perforce be absent when the House met. But the captain postponed, or neglected, his sealing expedition, and the clash came. The deadlock was absolute. Sir Robert Bond resigned. Sir Edward Morris became Prime Minister. Matters were not mended. The Governor, Sir William Macgregor, refused to grant a dissolution—there is the *geographical* point—chiefly because of the climatic difficulty in Newfoundland of holding a General Election at any time other than in the autumn. Winter sets in early, and, as it comes, the northern coast is icebound and communications cease. A little later and the rest of the island becomes inaccessible from an election point of view. In March and April, 10 per cent. of the adult males are off "sealing," though there may be exceptions, as the Bondites discovered. Early in May the whole fishing population—and there is not much else in Newfoundland—is off to Labrador and the Great Banks, and there it stays till October. The idea of holding an election on either of these sites does not appear to have occurred to the powers in authority. Of course, in the end the Governor had to give way, and for the first time for seventy years the Newfoundland elections were held in the spring, and the result was announced in May. The Morrisites came back to the House twenty-six strong, and the deadlock was over. But it was a mighty fight with geography.

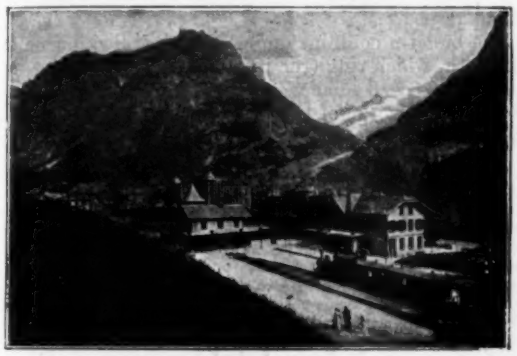
The Empire Up-to-date.

We should advise all teachers of geography to procure the famous "Empire Day" issue of the *Times*, which contained a huge supplement of fifty-eight pages on Imperial history and geography. The numerous articles are full of suggestions on such topics as Imperial policy and defence, Imperial and Colonial "preference," Imperial sport with rod and rifle, Colonial literature, Colonial wheat and gold, shipping, etc. The most recent additions to the Empire are commented on; nor is Lieutenant Shackleton's great expedition omitted. Over and above all are six up-to-date maps. Surely such a stupendous publication has never before been attempted by any daily newspaper.

A Book for Alpine Climbers.*

THERE are many of our readers who, when the yearly respite comes round, "lift up their eyes unto the hills" and find in their contemplation the help that was promised of old; and for those who have learnt to love the Alps, which in our fortunate day are almost as easily reached as the Grampians, Messrs. Methuen have just published a book which is intended to serve as a preparation for an Alpine tour, as well as a source of enlightenment when the journey is over.

It is a handsome volume of some 450 pages, and though the author disclaims any intention of providing an exhaustive description of the Alps, he has gathered



GRINDELWALD.
(From Messrs. Thomas Cook and Sons' New Programme.)

together more material than any ordinary traveller can use personally during a lifetime. Resisting the strong temptation to treat of the geology of the great barrier and the speculations on its origin and formation, he takes the Alpine chain as it is to-day, and from several points of view describes the mountains, passes, and valleys, as they touch the lives and interests of mankind.

Thus we have chapters on the pastures, the snow regions, the flowers, the beasts and birds, and the people, followed by a longer section on the political history of the Alps. Then comes a highly interesting chapter on the great historical passes, and one on exploration, followed by two on mountaineering. The humanistic standpoint is evident from this short list of the contents of the book, and the interest of the ordinary reader is therefore retained from start to finish. The last section is geographical, and treats in turn of the various Alpine regions in the west, central, and eastern divisions.

We have ourselves been specially interested in the chapter on the Alpine folk of to-day, as well as in the section which treats of the past history of these hardy mountaineers. The writer's point of view is indicated by the following:—

> "Anthropologists may weave elaborate and somewhat cobwebby theories as to the origin of this primitive folk, based on the length of the heads of their skeletons or the size of the limbs belonging thereto, but they can tell us nothing about them which is of human interest—their speech, their manners, their customs, their political or social institutions."

From this point the author proceeds to supply the facts which are of human interest, tracing the history of that very composite nation known as the Swiss, and estimating the effect on the racial character of the physical surroundings, which differ so greatly from those of the people of the plains.

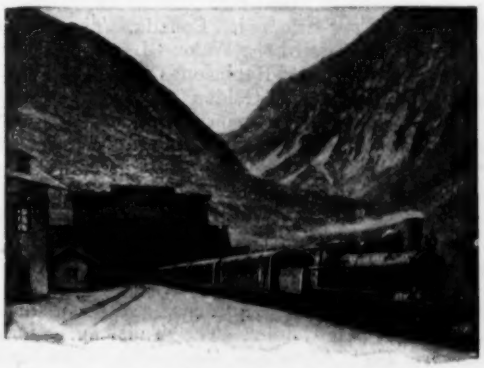
In harmony with his purpose, the author treats very fully of the means of communication in the Alpine district, and of those gates to the rock-bound region which are known as passes, and which from the humanistic point of view are more interesting and important than the snow-clad peaks and the gliding glaciers.

The section on guides and mountaineering, past and present, is full of interesting reading.

> "All Alpine guides are peasant proprietors in the first place. Hence during the nine months or so when they are not guiding they are occupied with cultivating their land, taking care of their cattle, felling wood for fuel, etc. In early summer the cows go up to the high pastures, so that their owners are free; while hay is largely made after the summer-climbing season is over. Many guides, too, follow regular trades; some are carpenters, or blacksmiths, or butchers, or keep small shops, or hire themselves out—in the case of the poorer men, as day-labourers, haymakers, etc. Others occupy official posts in their native valleys; so at Grindelwald both the President of the Commune and its Treasurer are actually glacier guides."

There is a glimpse of Alpine boy life in this same chapter which in substance at least reads like an idyll of Theocritus.

> "As early as the age of three or four an Alpine boy is well used to managing his small sledge down steep snow slopes in winter, even if it be only around his father's house.....At the age of seven the boy goes to school, but, of course, he goes there, in winter, on his sledge. In the afternoon he is free, so that



ST. GOTHARD TUNNEL.
(From Messrs. Thomas Cook and Sons' New Programme.)

he can toboggan or run about, or carry up coffee to his father at work among the hills. Often, on a holiday, a band of quite small boys will wander over

* *The Alps in Nature and History.* By W. B. Coolidge, M.A., Honorary Member of the English, French, and Italian Alpine Clubs. Methuen and Co. Price 7s. 6d. net.

hill and dale, or else make, with the entire school, or its upper classes, a great excursion—say, over the Wengern Alp. At school the boy is taught gymnastics of a simple kind, so that his small body gets well trained in many fashions. At the age of ten he will generally be set to chop wood for the use of his father's household. Later he will be sent out to look after the sheep or goats, or to lead them up to the high pastures, or to bring them down, the more valuable cows being under the charge of the older men."

One almost expects the refrain:—"Sweet are the voices of the calves and sweet the heifers' lowing; sweet plays the shepherd on the shepherd's pipe, and sweet is the echo."

A warm word of praise is demanded for the illustrations in this book, which bring home to the dweller in the valley all the beauty and the terror of the loftiest peaks "clad in cloud and snow." We have never seen pictures which surpass these in "atmosphere," and in the accomplishment of this perfection the block-maker and printer have done their part equally as well as the photographer.

THE ENGLISH ASSOCIATION.

THE eighth bulletin of the English Association contains much that is interesting and helpful for teachers of the mother tongue in both secondary and primary schools. It includes a suggestive account of English teaching in the schools of Liverpool, which concludes with a list of the English works studied in both secondary and elementary schools in that city. We may obtain some idea how the newer methods of teaching English are gaining ground from the appended list of texts and selections used in the various standards. One hopes that they are not "studied," but read and appreciated.

Texts and Selections.

Standard II.—The King of the Golden River. Selections from Shelley. Coleridge. Longfellow.

Standard III.—Fairy Tales. Selections from Hemans and Cook. Wordsworth.

Standard IV.—Alice in Wonderland. The Traveller. The Deserted Village. Macaulay's Armada. Selections from Campbell and Browning.

Standard V.—Settlers in Canada. The Story of Lancashire. Hereward the Wake. Lamb's Tales. The Merchant of Venice. Robinson Crusoe. Kidnapped. Tanglewood Tales. The Golden Treasury, Books I. and II. Selections from Tennyson and Shakespeare.

Standard VI.—Micah Clarke. Ivanhoe. In Golden Realms (one of Arnold's Literary Reading Books). Treasury of Verse for School and Home (Harrap). Tom Brown's Schooldays. The Faerie Queene, Book I. Julius Cæsar. Richard II. The Merchant of Venice. The Tempest. Selections from Shakespeare, Scott, and Kipling.

Standard VII.—Lamb's Tales. As You Like It. Richard II. King John. The Talisman. Marmion. Westward Ho! Christmas Carol. The Old Curiosity Shop. Tom Brown's Schooldays. Selections from Shakespeare, Tennyson, Longfellow, and Dickens.

Ex-Standard VII.—The Merchant of Venice. Twelfth Night. Julius Cæsar. As You Like It. Henry V. The Prisoner of Chillon. Hereward the Wake. Robinson Crusoe. Marmion. Hakluyt's Voyages.

Books for General Reading.

Arnold's Poetry Books. Alice in Wonderland. The Water Babies. Silas Marner. A Tale of Two Cities. Ivanhoe. John Halifax. Uncle Tom's Cabin. Our Village. Grimm's and Andersen's Fairy Tales. Stead's Penny Poets. Carrots. Tales from Chaucer. Odyssey. Iliad. Rossetti. As You Like It.

Grammar Texts—Nesfield. The Mother Tongue (for use of teacher).

Composition Handbooks.—Nesfield. Elements of English Composition (Ginn and Co.). Illustrated Composition Series (Nelson). Manual of English Grammar and Composition. Literary Reading and Composition, by L. Marsh (Blackie). The Class Teaching of English Composition, by the Principal of St. Mary's Hall, Mount Pleasant (Longmans).

Annotated Editions.—Used in six schools for the study of Shakespeare.

The bulletin contains appreciations of Swinburne and Meredith, which ring true in almost every sentence, and will serve to send some members of the Association to the little-known works of these two masters. As a sample, take the following on Swinburne:—

"On the lyric of the future 'his seal is set.' The great artist who described him as 'a reed through which all things blow into music' concentrated appreciation in an epigram; and subtle echoes in his own work show that he was sensitive to the spell. The apples in the *Voyage of Maeldune*, 'redder than rosiest health or than utterest shame,' or the beautiful lyric which opens the second act of *Becket*—'Is it the wind of the dawn that I hear in the pines overhead?'—are typical passages which recall the younger poet's manner and pay a signal tribute to his genius.

"In one respect the very completeness of Swinburne's triumph over form has done him an injustice. It is easy to surrender one's self to the enchantment of the verse, to drift down a stream of melody, and lose all thought for anything beyond. But the stream has depth as well as flow. Illustrative quotation is impossible, and to subject such poetry to analysis seems a profanation. But a mere fragment torn from its context in the *Halt before Rome*, the picture of Italy before she became a nation—

'Only her bosom to die on,
Only her heart for a home!'—

will at least serve to indicate the poet's imaginative power. He has concentrated into that brief, poignant image a sublime and passionate patriotism; the thought, in itself high and noble, finds magical expression; he writes with the strength of Shakespeare."

We hope that the English Association will continue to give us appreciations of this quality, though comparisons at this early stage are dangerous. Let the student of our literature compare the comments on the work of Tennyson at the time of his death with the received opinion of his place among the immortals at the present day. We were told that the giant three were Shakespeare, Milton, and Tennyson. Now we place the last with Keats.

A Word to the Wise.—Illustrated papers of the better class are often extremely useful educationally as a means of awakening the interest of children in current events and teaching them a general knowledge of the world. Those teachers who do not already use the *Illustrated London News* for this purpose would do well to look at the series of supplements which that paper is publishing on the industries of great cities. A descriptive account of Sheffield was given in the issue of 1st May, and Manchester and Birmingham will shortly be treated in the same way. These accounts convey much information, both historical and technical, in an attractive and intelligible form. From both illustrations and letterpress a great deal can be learned as to how things are made, where the raw material comes from, and who are the men who have made great inventions and built up important industries.

GEOGRAPHY IN THE LOWER STANDARDS.

A SUGGESTED REVISION.

BY A. J. KER, NORTHFIELDS BOYS' SCHOOL, W. EALING.

WE all know the old schemes of lessons in geography in the lower standards of the primary school. *Standard I.:* "To understand what is meant by a plan—the cardinal points—definitions of the chief geographical terms." *Standard II.:* More of this, with the application of the knowledge gained on plans to the understanding of a mythical map—a deeper knowledge of geographical terms, the acquisition of which was made easier (?) by a study of the wonderful map which conveniently contained an example of every possible "term" the boy would meet with afterwards, together with a few that he would not. In *Standard III.*, I believe, the unfortunate youngster whose mental digestion had been sadly impaired by a heroic effort to assimilate what had been proffered him in the previous classes, was nurtured for a year on the questionable food that could be extracted from an indigestible concoction labelled "England and Wales." A few of these schemes, bilious-looking from senile decay, are still extant, carefully preserved behind glass as awful examples of what should be avoided.

But is everything well now? I doubt it. I have before me an up-to-date syllabus in geography, and in the work for these lower standards I find these points for study: "Apparent daily motion of the sun in direction and altitude;" "The cardinal points;" "Plans and maps of the school and neighbourhood;" "The work and use of rivers;" "The layers forming the crust of the earth;" "The construction and reading of orographical maps;" "Winds and rainfall;" "The size and shape of the earth;" "Effect of structure upon coal deposits," etc., etc. The last item came under the section "Regional Geography," and the "region" is "England and Wales." How the good effects of "Empire Day" must be nullified in the unfortunate Standard III. whose teacher is following this syllabus! Who can wonder at the decay of patriotism when the term "England and Wales" suggests to a boy a "dry" lesson on such a technical monstrosity as "the effect of structure on coal deposits"?

Now let us consider in detail the advisability or otherwise of such "points for study" as these by the boy of Standard II. or III. I do not wish to suggest that many of these subjects should not be dealt with; the point is *when* should they be studied? But I shall return to that later.

Let us deal first with that "abstraction of abstractions" to a boy of six or seven—a plan or a map. That they must necessarily be abstractions to boys of this age no one will deny; and that children should be introduced to such a fascinating realm of knowledge as is embodied in the term "geography" through the medium of lifeless and arbitrary conveniences seems to me to be a great pity. If I had my way, no plan or map should help to mar the happiness of any innocent boy in Standard I. or II. He should hear about rivers, mountains, rugged coasts, and strange peoples living in primitive villages hidden away in the depths of primeval forests; he should see pictures and photographs of them; but he should not be troubled with the knowledge that man has found a method of representing rivers, mountains, coasts, and towns by what must be to a boy an unappealing code of wavy lines, "herring-boning," black smudges, and insignificant dots. Further, what is he to have a plan of? Of his school, his classroom, his town. This is adding insult to injury. In the geography lesson, at least, let his fancy and imagination still have play; take him away from the school, the playground, and town in which he lives. His little mind has been stored in the infant school with tales of fairyland. Do not let his descent to the realism of unadorned facts be too sudden. Show him something of other fairylands—lands that he may visit some day—full of curious people, of wonderful buildings, of towering mountains, and of wild, unvisited headlands where the sea-birds call.

"The apparent daily motion of the sun in direction and altitude." This was put down in the syllabus as the first geographical fact to be instilled into the children of Standard I. Again, to a child of this age, such a point is the veriest abstraction. Of relative motion he can form but the vaguest idea. And the presence of that word "apparent" makes me confident that the teacher, from his pedestal of superior knowledge, is supposed to shatter ruthlessly, if he can, any delusion the little fellows may be joyfully labouring under as to the sun "getting up" in the east and "going to bed" in the west. Let them think that the sun does this for a year or two longer; they will be none the worse.

"The work and use of rivers"—still for Standards I. and II. Save with the most sympathetic treatment by a very capable teacher, "the work of rivers" would mean to such children a lesson from which they would gain no real good and no pleasure. As for the "use of rivers," that would be best left until they shall have reached that age when they are able with advantage to study the geography of a country from a commercial standpoint. By no means allow them to reach Standard IV. without knowing much that is meant by the name "river;" arrived at Standard IV., they should be familiar, through the medium of pictures, drawings, or graphic descriptions, with such natural wonders as the Nile cataracts, the vast flooded forests of the Amazon and Mississippi basins, the cañons of the Colorado, and the Falls of Niagara. But the "work and use" leave to a later period.

"The 'reading' of orographical maps." Euclid is doomed. But before his deposition men were often spoken of as having *read* him. Elastic as that fact shows the term "read" to be, what of the boy, aged seven, who has to learn to read an orographical map? What advantage is it to him—a boy in the lowest standard, after many hours of instruction wearying to himself and more wearying to the teacher—to be able to reason that if a range of mountains run in *this* direction, a river will flow in *that;* and at the mouth of that river a town will probably spring up? It is a poor exercise in probabilities that would be with advantage left to older scholars.

I have said enough, however, to explain my objection to the inclusion of points like these in geography syllabuses for the lower classes. I plead for the deletion of all such abstractions from the geography lesson until Standard IV. is reached.

Arising from my contention is one other point that must be considered; and here I know that I shall be treading on very controversial ground. The usual order in teaching the geography of countries is this: British Isles, British Possessions, Foreign Countries. Now I beg to say that, with certain limitations, the order

should be reversed. As long as the syllabus is arranged so that a boy in Standard III. has an opportunity of learning the main outlines of the British Isles, that is sufficient.

Begin, then, in Standard I. with something that will be sure to appeal to their young and eager imaginations —a foreign country and its people; a people of different tongue, costume, and customs. Make much of contrasts with those things with which the boys are familiar. At the end of the year, if the subject were treated in the way I have indicated, the names "river," "lake," "mountain" would have some real significance to them, although they might not be able to repeat the old formula concerning "fresh water"... "sea or lake." In Standards II. and III. this would be continued, and the scheme appropriately widened, with the addition that the most important facts of their own country would be included in Standard III. (manufactures, facilities for commerce, zones or centres of production being strictly taboo).

Standard IV. would start with some of the British Possessions. And now, in connection with this course, there would be included some teaching in those points of physical geography which have hitherto been avoided, and it will be found that the scholar's advance in years and intelligence will more than counterbalance any ill effects from beginning this section so late.

When a boy has reached Standard VI. he will be studying "The British Isles." Here there will be no glaring contrasts to rivet his attention; nor will he need them. He will be in a much better condition to discuss such matters as "the effect of coal deposits on manufactures;" and he will be dealing not with such unnecessary details as the "chief towns of Peru," but with those facts of his own country, a knowledge of which will be so more helpful to him as a future intelligent Englishman and citizen. With this specific geography, as now, would be taught the chief facts relating to climate, rainfall, seasons, tides, and winds. And these things could now be taught much more effectively. For instance, in dealing with the heavy rainfalls of Assam, you would not be talking of a place of which the pupil knew nothing; in referring to continental climates, his early descriptive lessons on "Life in Moscow" would furnish him with a splendid illustration.

Finally, in Standard VII., along with a more advanced study of England, would go a more detailed study, mainly from a political standpoint, of foreign countries.

JAPANESE PICTORIAL ART.

BY KEN HOSHINO.

Japanese Nature Studies.

ENOUGH has been written on Japanese pictures of the artists of Ukiyoe school, such as Utamaro, Toyokuni, and Harunobu. Yet very little is known about Japanese studies of birds and flowers by artists of the Nature schools which have been handed down from century to century in the persons of such great artists as Tosa, Sumiyoshi, Fujiwara, Korin, Maruyama, and Shijio. Were it not for these Nature schools, the pictorial art of Japan would be of but a negligible quality. He who wants to see inspiring religious pictures may well visit the Italian galleries; and faithful and vigorous representations of rural scenery and peasant life may be found in the works of the Dutch painters. Vivid portrayal of character is a feature of the masterpieces of the British artists; but if one wants to see studies of birds and flowers, one must visit some of the Japanese art studios.

Yet, from the point of view of the realist who "draws things as they are," a Japanese picture is not satisfying, as there is very little feeling of near and far, light and shade. To him the picture appears as a simple conventional design, and it is as a design that he appreciates it. The spirit of adoration of nature, which is the very being of the picture, is unheeded, and all his admiration is excited by the harmony of colours, the rhythmic quality of line, and the balance of the composition. From the point of view of the realistic impressionist, however, it appears as a picture of a higher order. He knows that the absence of light and shade and perspective does not make it "conventional." He sees the simplicity of nature on a level with the faithful utterance of a poet who responds to the grandeur of nature

in his seventeen phonetic sounds. He sees, too, the delicacy of nature, with its song of birds high up in the clear sky. He may fail to see the detail in the picture in this particular bird or that particular flower, but he will see in it that the movement of the bird and the living flowers as shown by the great Japanese artists are more than mere design.

We see, then, that appreciation of Japanese studies of birds and flowers depends entirely upon the attitude of the critic. To share the depth of feeling of the artist one must become either an artist oneself or a child—free from prejudice and scientific bias.

How Japanese Colour Prints are Made.

The artist draws a picture on thin paper, which is then handed over to the wood engraver. After pasting the sketch face down on a block of wood—a piece of cherry wood which has been kept in the shade for years—the engraver cuts away the superfluous wood, leaving the outlines in relief. The resulting block is called *genban* or "key block."

The printer then applies black paint to the block,

and lays upon it a sheet of paper, and with the *baren* or "pad" exerts sufficient pressure to make a print of the raised outline.

Copies of this "black proof" are then worked upon by the artist, who colours them—that is to say, he prepares one with red, one with blue, and so on—one coloured sheet for each of the colours, which, when finally printed, will produce the desired result by combination.

The coloured sheets are each treated by the engraver in the same way as was the key block, the necessary portions of the wood surface being left in relief.

When the blocks have all been cut, they are piled up one upon another before the printer, who takes them one at a time and prints them from the second block, painting it before each impression with the desired water colour. Great care is required on the part of the printer in placing each separate sheet exactly on the block within the register marks.

The final print, with all its gradations and variety of colour, is therefore the result of a number of impressions

upon a single sheet of paper, each impression being in a different colour, and produced by the pressure of the *baren*.

Ukiyoe.

The literal meaning of the word Ukiyoe is "the mirror of the passing world," or the "picture of the earthly life."

The subject-matters of this class of picture are chiefly the fashions and manners of people. The portrait of an actor, a scene from the stage, pictures of the famous beauties of Yedo, or, perhaps, a festive scene of rustics.

It was considered a less ideal form of art than the works of the naturalistic school, and was despised by the aristocrats, regardless of its merit, upon its inauguration by the great artist, Iwasa Matabei, at Otsu, in the early part of the seventeenth century.

Yet what this style of art has done for the culture of the people is incalculable. For it was Ukiyoe which encouraged the art of printing in Japan—in fact, the history of Ukiyoe can be said to be the history of the art of printing in colours from wood blocks.

READING IN EVENING SCHOOLS.

BY T. SHOPLAND, B.A., COUNTY SCHOOL, REDRUTH.

READING is a subject which, at first sight, one would not expect to be necessary in an evening school. Yet it is found essential to include this subject in the curriculum, not only of rural evening schools, but also in that of a great number of town schools. Why, after a child has passed through the standards in our day schools, it should be found that he can neither receive the impression conveyed by the written word, nor express in intelligent language any ideas which may have been conveyed to him, is a little difficult of understanding by the average lay mind. The reason is obvious. The children do not attend the evening school until they have left the day school for a considerable time, and for the first time have begun to realise the importance of education. After examining the returns from a large number of schools chiefly in the west of England, we find that only about 15 per cent. attend the evening school directly they leave the day school. There is a very wide range also in the ages of the students, extending, as they do, from fourteen to thirty years of age. Then the number of those who have at any time reached Standard VI. of the day school is often as low as 20 per cent.; indeed in some schools one finds not one student who has reached this standard, and in quite a number there are none who have reached Standard VII. Is it any wonder, then, that when there are students who originally have no great attainments, and who have not read anything for two or three years (if, indeed, they can be said to have ever read at all), they are found deficient in the very elements of education? It is clear that without intelligent reading one can do little with any student. Yet the teaching of the subject in the evening school bristles with difficulties, and teachers are sometimes almost hopeless about it. They have quite enough of it in the day school, and would gladly leave it out of their evening school, were it possible to do so. It seems strange that a faculty which to most of us has brought more pleasure and delight than any other we possess fails to attract pupils such as there are in our continuation schools.

It seems fairly certain that in teaching this subject we must keep before us two very clear and definite aims: first, to create and strengthen the power of comprehension; and second, to train and make easy the power of expression. In other words, we wish to enable the student to grasp the thought of others, and so have the power of expressing that thought in his own language. The second faculty is an essential corollary of the first. Until the student can express himself, either orally or in writing, he cannot be said to have successfully read a passage. Clear understanding implies clear expression. If these are the goals to be set before us, how are they to be reached, and what must be avoided?

Perhaps in the past we have devoted too much attention to the study of words. The word in a sentence may be important; it is less so in a page, and less still in a chapter. If the pupil stumble over the pronunciation of a word, or has only hazy notions as to its meaning, we should not be too anxious to supply his deficiency. Train him to grasp the meaning of the sentence as a whole. The increase in vocabulary which we desire will follow more readily from an increase in the amount read rather than by a close application to text.

The average boy of ten who lives in a home where books are common will read dozens of books, and gain a number of ideas and the use of a number of new words: but if he had a tutor ever at his side to ask him to explain the meaning of this or that word, he would probably throw up the whole thing in disgust, and a real delight would be changed into an irksome task. In reading an interesting book in a foreign language, do we always interrupt the flow of the narrative when a new or unusual word is met? We have the sense of the paragraph and a shrewd suspicion of the meaning of the word—a suspicion which further reading possibly confirms. Sentence ideas must take the place of word ideas. Then it is well to remember that the evening school student wants to read for his own edification and amusement, and not to give pleasure or information to any one else. Thus for the teacher to read aloud as an example to the student is to waste time. In certain cases he would do so if by such means he is likely to bring out more clearly the meaning of a passage, but as an example of expression we are proceeding upon wrong lines. Understanding must come first, and then expression, such expression as the student is capable of, will follow. You can only get expression through comprehension: it must come from within and not from without; it must be expression due to intelligent appreciation, and not the expression of the parrot.

Moreover, we would suggest that to spend lessons on sketches of the author, outlines of the book, etc., is also quite unnecessary, and indeed harmful. When you have finished your study you may have a talk about the author; but it would be better to recommend other works written by him, and leave the student to find out what he can about the writer. His reading, if it has been intelligent, will tell him something, and perhaps quite enough. At any rate, the teacher's object must be to give information through the text of the book, and the thoughts which that text arouses.

Then one would emphatically protest against the use of the ordinary day school reader. If you wish to spoil your class from the very start, you cannot do better than invite them to tread again the old road over which they have so often passed, to go through thoroughly familiar scenes once more, and to remind them of the weary ways they have been so eager to quit. You must give them something fresh, something new, something with a real power of attraction in it. You are not dealing with those who have any love for learning; this it must be your task to awaken, encourage, and stimulate. And we would add, let them read a book, not a series of extracts from various books, but a complete volume—something that will necessitate a sustained effort, and which will demand sustained interest. Let them be called upon to remember previous incidents and scenes, and to exercise imagination as to what is coming after. Let curiosity, that potent factor in the young, be aroused. Much improvement in this respect has been made in recent years, but old customs and old influences die hard. The use of more than one book during the session seems desirable. If we try to keep a student from September to March reading one volume, then no matter how interesting it may be, no matter how keen the student is or how enthusiastic the teacher, we are courting failure. We are putting too much strain upon both student and teacher. It is a serial tale too long drawn out. Take at least two books. Moreover, the use of abridged editions should be avoided. The teacher should make his own abridgment; it must be a matter of his own knowledge, and to some extent of his own tastes. He will imprint his personality, in this respect, upon the student. There are three points to be observed in the selection of our book:—(1) It must be attractive to the pupil; (2) it should be familiar to and well known by the teacher; (3) it must not be too difficult for the class, and it must add to the pupil's fund of knowledge. One cannot too strongly emphasise the importance of real knowledge and real keenness on the part of the teacher. Then a book may be quite suitable to a locality, and may be thoroughly familiar to the teacher, and yet be quite unfitted for the class. For instance, *Westward Ho!* is naturally a favourite book in the west, and is used in a number of evening schools. Yet if the students are not fairly good readers to start with, it is probably not a suitable book. It is too full of incident, and requires a sustained interest that the undeveloped or poorly developed mind does not possess. *Lorna Doone* is a book which one does not commonly find read in western schools, and yet it is a greater Devonshire book perhaps than Kingsley's famous novel. And there is some force in the contention that time is too limited in the evening school to cultivate a sound and healthy love of literature. Your choice of book therefore must have some direct relation to the general aim of the instruction. It should add to the pupil's stock of general knowledge. It must not be read merely for amusement; it must instruct. If there are decided contrasts of character, so much the better. There is room for discussion and expression of opinion about these. Scott, so often read, seems to be for the older and more advanced student, and perhaps the same remark applies to Dickens. In choosing a book consider the books you liked as a child—tales of adventure, imaginary scientific wonders, tales true or imaginary of conquest by land or by sea, tales of travel and exploration. Youthful nature is much the same now as when we were children, and these books still possess their attractive power. The difficulty of making a choice lies not in the want of suitable books, but in the number from which a choice may be made.

Having chosen our book, how should we deal with it? It is essential that the teacher should prepare each lesson. The reading lesson is more difficult for the teacher than the arithmetic lesson, and a study of principles and methods is even more necessary in this than in the more ambitious subjects taken in many evening schools. The pupil must own his book, and be able to carry it away. The small amount read in class is quite useless. There must be home reading. One knows the difficulties of getting work done at home, but it is doubtful if there can be any success without such work. Work should be mapped out at the beginning of the session. Some chapters would be read aloud by the teacher. A humorous scene is often best treated in this way; the full flavour of the humour is given to the student, and all enjoy it together. If it is really good, and has appealed to the class, the student may be tempted to read it again for himself. Where dialogue occurs treat it naturally, and let students assume the characters and read aloud. But it is difficult to read aloud at sight. The readers should therefore be chosen in advance of the lesson, and they should have time to read through their parts. In very few other cases should reading aloud be encouraged. Keeping in mind the purpose with which we started—"to

create or strengthen the power of comprehension"—we shall probably decide that reading aloud is a positive hindrance to understanding. The reader has to concentrate part of his attention and part of his effort on the mechanical details. When reading silently we give our whole attention to the meaning of the writer. We would suggest therefore that most of the lesson should be devoted to silent reading and to questions. This will require a teacher thoroughly alert, keen, and active, or, of course, the students will abuse the teacher's confidence and waste their own time. Any slackness on the part of the teacher will be fatal. He can be busy the whole time, answering or asking individual questions. As to the book itself, some chapters will be allotted for home reading, and only brief summaries of these will be given by the teacher. Others will be only partly read, a whole page or pages being left out as unessential; for, you remember, we suggested that the teacher was to do his own abridgment. Other chapters may require brief attention only, the principal features being pointed out to the class; while to others will be devoted much time, much explanation, much study, and, most important of all, much discussion. The pupils must be encouraged to talk, and to discuss their book—to ask questions upon it, or even to question it. They must not be allowed to accept any statement as true because they read it. The lead to the discussion may have to be given by the teacher, but it is a power which quickly grows. It assists the cultivation of the power of expression, and renders more easy the writing and composition exercise. Much improvement can be made in the teaching of this subject, and it is one which, unfortunately, cannot at the present time be omitted in a very large number of our evening continuation schools.

ON TELLING A STORY TO CHILDREN.

BY AMY BARTER, L.L.A.

(*Continued from page 15.*)

ANOTHER reason why stories of this type should be excluded is that it is not good to place such pictures of life before a child. The imagination, that great and royal gift which makes so much of the glory of childhood, should not be forced to work on things ugly or mean or sordid. Therefore I would not let any child hear such stories as those contained in *Jessica's First Prayer*, *Froggie's Little Brother*, *Little Meg's Children*, and similar books. It may be said that children love these stories. Some of them certainly do, but this is probably because they have never known anything better.

Nothing horrible or gruesome should be presented to the notice of children. This rules out many of Grimm's and some of Hans Andersen's fairy tales, as well as some stories from history and from the Old Testament. On the other hand, it is not necessary to eschew all stories whose subject is of a sad or a solemn character, provided only that the pathos is dealt with in a simple and unsentimental fashion. For example, the stories of Little Nell and Paul Dombey are always attractive to children, since to them death is not terrible, but only wonderful and awe-inspiring.

Tales of youthful prodigies—whether they die young, or whether they live to attain fabulous riches and honours—should be avoided. Especially is this the case when, as in so many instances, the figure of the naughty child who comes to a bad end is set over against them. *Little Lord Fauntleroy* and his prototypes, who convert their elders, and whose sweet smile of childish innocence acts as a talisman to soften the hardest hearts, may be charming, but they are certainly a little bit priggish and sickly. If the teacher wishes to demonstrate the influence a child may have upon grown-up folks, let him take some such story as that of Eppie from *Silas Marner*—naughty little Eppie, who, though she drew her foster-father into renewed sympathy with his kind, often made it necessary for him to consider the alternatives suggested to him by Dolly Winthrop—"Smack 'em, or the coal-hole."

The namby-pamby story, still unfortunately too common, especially in infant schools, should be allowed to die out altogether. Do not tell the children how little Willie played with the fire and so was burnt, or how Kate neglected to mend a little hole in her frock, which became a big tear that kept her indoors busy with needle and cotton while her sisters were at play. Do not people the children's world with such dull and colourless folk. Teach them to look upon their fellow-creatures as intensely interesting human beings, not as mere mechanical puppets. Tell them about real live children with warm blood in their veins. Let them know Maggie Tulliver, and how she forgot to feed Tom's rabbits, and how she suffered for her carelessness; show her standing in her mother's bedroom, with her severed black locks lying round her on the floor, and with the agonising consciousness of apricot pudding and custard downstairs, which for her now must come among the might-have-beens. Or introduce them to Tom Brown, whose fascinating adventures, from the time that he went fishing with old Benjy to the day of his last school cricket match, will afford material for a whole series of stories of the same class.

All the foregoing warnings may appear to some to be superfluous, applying as they do to pitfalls which are too obvious to be dangerous. Yet it is of the truths which are so obvious as to have become commonplaces that we often need to remind ourselves.

What is the very best type of story for children? I would say without hesitation the old myth or nature story, whether of classical, Eastern, Celtic, or Teutonic origin.

Why does the child wish for a story? For exactly the same reason which moves us adult folks to a similar desire. We, the majority of us, are intensely interested in life. We want to understand all its problems, and to enter into all the experiences it can offer, sorrowful as well as joyful. We want to know all there is to know about life, and so does the child; only his nature is free from the morbidity and satiety which sometimes lead the adult to revel in the unpleasant or the unnatural side of human experience.

If we could only put ourselves in the position of the child and see the world with his eyes, we should realise his wants, and be able to satisfy them. This is what has been done in the case of the old myths. One cannot read any of these stories without realising how strongly they bear the mark of the child. The teller must have possessed great intellect, ripe imagination, and a marvellous grace of expression; yet he was a child who believed heartily and thoroughly in every fact he related, with a simplicity of which the adult mind of to-day—even the mind of the man of genius—

is not, in the nature of things, capable. And this childishness of spirit, this absolute absence of self-consciousness, is, I would venture to say, recognised at once by children of later ages. There is much in the old stories which they cannot fully understand, more that they cannot fully appreciate, yet there is something within them which answers at once to the call which comes in a familiar voice.

The educative value of these old myths can scarcely be overestimated. They are beautiful and wonderful in themselves, and they form an introduction to a large part of the best literature the world, in every age, has produced. Every teacher should use these as a touchstone, by means of which he may test the value of other stories he meets with in his search through the wide realms of literature. For there is scarcely any department of literature, except the purely technical, which will not yield him something. The old mediæval romances are rich in stories—for example, the story of the dwarf Trone in *Ysaie le Triste*; the story of Oberon in *Huon of Bordeaux;* the story of the ape and the children of Milles in *Milles and Amys*. From the old legends of the saints quaint and beautiful episodes can be taken—St. Florentin and the bear, or the tale of the crow and the ring in *Ovicula St. Francisci*. Chaucer will give his *Nonne Prestes Tale*, besides many episodes from other stories told by his Canterbury pilgrims; Spenser's *Faerie Queene* is a mine of wealth, from which such gems as the story of Una and the lion may be dug; while Shakespeare gives us his infinite variety, from the lovely idyll of the history of Perdita to the dainty yet farcical scenes of *A Midsummer Night's Dream*. History and biography yield a rich harvest to the teacher; fables and ballads may be pressed into his service. Even from books which seem at first sight most unlikely to serve his purpose telling incidents may be gathered—for example, the episode of the jewel-decked ambassador's visit to Utopia, from Sir Thomas More's book, would work up into an effective story. Of the huge mass of modern literature, a very considerable part of which has been specially written for children, it is impossible to speak in any detail. The teacher must not, of course, confine himself to one type of story, but must try to gather a varied selection. Yet he will tell best that in which he himself is most interested, since enthusiasm in the teller is a necessary condition to the success of any attempt at story-telling.

The teacher, having chosen his story, must next consider how best to present it to the children. This is, naturally, a much more difficult part of his work, and one in which he will obtain less help from any principles that can be laid down. Ready imagination and quick sympathy will be his best guides, and the most valuable maxim which can be recommended for his consideration is "Practice makes perfect." From some initial mistakes, however, the beginner may be preserved by means of the experience of others, and it is in this hope that the following suggestions are offered.

Thorough preparation is essential to successful story-telling. The teacher should never attempt to tell a story he has read up the night before. It should have lain in his mind at least for some weeks, until it has thoroughly taken root there. Then it should be gone over very carefully, and all excrescences which interrupt the course of the narrative should be pruned away. This process is very necessary, though somewhat difficult. Children love detail, but they are impatient of digressions; the teacher must therefore work his descriptions skilfully into the course of his tale, not present them in "chunks." The Homeric stories are excellent models in this respect, their beautiful and appropriate epithets often taking the place of a whole clause or sentence. The teacher should consider carefully the exact words in which he purposes to tell his story—not, of course, getting the whole thing by heart, but trying various forms of expression in special cases, arranging an effective opening and conclusion, and judging whether the effect of the whole is simple and natural, yet as beautiful and dignified as he can make it. If he is fortunate enough to possess a small relative on whom to practise, such an opportunity should not be neglected.

It is sometimes necessary also to prepare the minds of the children for the reception of the story. For example, if the teacher means to tell the adventures of the Argonauts, it would be well some days before to place in the schoolroom a print or rough drawing of a Greek ship, and allow the children an opportunity of studying this. In the same way the story of the Elfin Page, from Scott's *Lay of the Last Minstrel*, should be preceded by the imparting of some information concerning a Norman castle. The imaginations of the children cannot work freely if brought up against some object towards the building of which their previous experience has provided them with no material. The illustration should be given *before*, not *during*, the telling of the story. Any attempt to appeal to the eye and the ear at the same time will mean that some of the benefit which each appeal is capable of yielding will be lost.

The teacher should go straight to the story, with as few preliminaries as possible. The old hackneyed beginning, "Once upon a time," is almost an ideal one. It takes the hearers away from their immediate surroundings, and sets them down in some vague, far-off age, where they are prepared for wonderful and interesting happenings. It introduces, without waste of time and without mental effort, the "story" atmosphere, which is such an essential condition to success. The teacher of to-day may well take example from its simplicity and directness. In the same way the old ending, "They lived happy ever after," may serve as an object lesson on how to bring a story to a conclusion. Leave the children in a position to see the story stretching on, and telling itself through long vistas of time; leave them free to form for themselves a series of vague, delightful pictures, which will help to preserve the stories in their memories. The ending need not always be happy—it may be pathetic or disastrous—but it should never be such as to leave no outlet for the imagination. If Paul Dombey dies, Florence still lives; if Troy is taken, Ulysses must be followed in his voyage back to his native country.

Tell the story quietly and naturally, with little attempt at dramatic action or gesture. I cannot help thinking that the sprightly, laboured manner so often adopted by teachers, especially by teachers in infant schools, is a mistake. This sustained vivacity must be a tremendous tax on the energies of the teacher, and must be irritating and disturbing to the children. I have every sympathy with the little scholar in a school for the "mentally deficient" who, at the end of a summer afternoon, said wearily to her too energetic teacher, "Oh, teacher, do stop makin' such a noise; I've got the 'eadache with yer." I am afraid our pupils very often "get the 'eadache" with us. We

do not allow them to follow out quietly and naturally the thought on which they have eagerly seized, but distract them by over-conscientious efforts to make the thing interesting, and striking, and impressive.

If one watches a child or group of children listening to a story told at home by a mother, one has a chance of examining story-telling in its most natural form. The interest excited is intense; the impression made is, as we know by experience, deep and lasting. Yet probably the voice of the teller has sunk even below its natural pitch, and has insensibly taken on a sort of cadence; she makes no attempt at dramatic action, but sits still, kept in one position, probably, by the encircling arms of her hearers. All her effects are gained by subtle intonations of the voice, by pauses, by the varying, sympathetic expression on her face. She may be only a very indifferent story-teller, yet, by following instinctively the method which Nature teaches, she ensures for herself a considerable measure of success. I would have these natural conditions reproduced as far as possible in the story-telling which takes place in school. The arrangement of the class should be less formal, the discipline with regard to position, etc., less careful. The children should feel free to ask a question or to give vent to a natural expression of feeling. The teacher should try to lose all self-consciousness, and be content for the time to abdicate his position as the most important person in the room. He should aim at attracting little attention to himself, and concentrating all interest on his story.

The course of the story should not be interrupted by comment, reproof, or even by the introduction of illustrations. Opportunities for pointing a moral must be sacrificed, and small infractions of discipline must be overlooked. Pictures may be shown after the lesson, when they will be received with eager interest, but not during its course.

OXFORD VACATION COURSES.

We desire to draw the attention of our readers to the programme of the forthcoming Summer School of University Extension students, which will be held at Oxford during the month of August. The programme is not only an exceedingly attractive one, but has obviously been most carefully devised by the Delegacy with a view to educational efficiency. The programmes of these Summer Schools become more systematic and elaborate year by year.

The prospectus for the present year at Oxford falls naturally into three main sections:—

1. The general scheme is intended to illustrate the place of Italy in world history, and its contributions to literature, art, science, and thought. This section, which contains a historical course from the fall of the Roman Empire down to the formation of United Italy, has been organised on a very elaborate scale, alike from the point of view of lovers of Italian literature and lovers of Italian art.

2. Another section will be devoted to political and economic science, and will include courses of lectures on the problem of industrial peace, and another on English political institutions. In connection with the former a conference has been organised, to take place on Saturday, August 7, at which the Right Hon. D. Lloyd-George, Chancellor of the Exchequer, has promised to preside. Among others who are expected to take part in the Conference are, the Right Hon. Sir Horace Plunkett, Sir Christopher Furness, M.P., Mr. H. Vivian, M.P., Mr. J. Ramsay Macdonald, M.P., and Mr. D. J. Shackleton, M.P.

3. There is also a special section designed for foreign teachers, including lecture classes in phonetics and the English language.

Finally, special classes have been arranged in practical map-making, in the theory and practice of teaching, in which Professor Sadler will take part, and in the Italian language.

The meeting will open on July 30, and close on August 23, and will be divided into two parts, for the convenience of those who are unable to remain for the whole time.

OUR COOKERY COLUMN.

BY ROSAMOND CANDY, FIRST-CLASS DIPLOMÉE, NORTHERN COUNTIES SCHOOL OF COOKERY.

JAM-MAKING, BOTTLING FRUITS, AND PICKLING.

JAM is easily made and easily kept if care is exercised in the preparation, and if the following hints be observed:—

1. The fruit must be gathered *dry*, for if it is damp then there will be difficulty in keeping it, and it will soon become mouldy. 2. Fruit should be boiled as soon as possible after gathering. 3. Sufficient sugar must be used, which should be of the *best*. It is false economy to purchase cheap sugar for preserving. The quantity depends on the amount of fruit, and varies from three-quarters of a pound to one pound of sugar for each pound of fruit. 4. An enamelled saucepan is preferable for jam-making, and a wooden spoon should be used for stirring. An iron pan or spoon will spoil the colour. 5. The colour and flavour of jam are best preserved by boiling rapidly and stirring constantly. 6. Glass bottles are to be recommended, as then any signs of mould or fermentation are easily detected. 7. Place a round of thin paper dipped in brandy on top of the jam, and tie down with parchment paper. 8. A neat label with the name of the jam and date of making, etc., written plainly, should be placed on each jar. 9. All jam should be stored in a *cool, dry place*, as damp will turn it mouldy and heat will make it ferment. 10. Jam-making, although a simple process, requires much attention, which should therefore be undivided. 11. Home-made jam, when carefully made, is much superior and more wholesome than any which is offered for sale.

When making *strawberry*, *raspberry*, or *apricot jam* these fruits must be kept *whole* as far as possible, and to ensure success in this a syrup should be made and the fruit boiled in it.

Strawberry Jam.—The following is a good recipe:—Pick over the fruit and allow three-quarter pound best *crushed* loaf sugar to every pound of fruit; sprinkle the sugar over the strawberries, and leave to stand all night. Next, boil the juice which runs from the fruit for about quarter hour, and then carefully add the strawberries to this syrup and boil for *twenty minutes*, stirring gently. To test, place a little on a saucer, and if it jellies in a few minutes it is cooked enough.

N.B.—If strawberry jam is *over-boiled* it turns a brownish colour and has a very unappetising appearance.

The most successful sugar to use is the best *centrifugal*. It is a little more expensive, but amply repays for the extra outlay.

Raspberry Jam is made as above, but is seldom kept whole unless the fruit is very large and dry; and this jam is greatly improved by the addition of red-currant juice. So also are jams made from cherries and strawberries, but, of course, the extra sugar must be added in proportion, with the juice—three-quarters pound sugar to one pint juice.

Apricot Jam is also made in the same manner, but the jam is improved if the apricots are skinned before preserving, as the skin is woolly and tough. The fruit is cut in half and the kernels removed, which are blanched and added to the jam. Boil three-quarter hour.

Black-currant Jam.—This fruit being of a dry nature, moisture must be added in the form of red-currant juice or rhubarb juice. Allow one pint *extra*

juice to three pounds fruit, allow three-quarter pound sugar to every pound fruit, and allow three-quarter pound sugar to every pint of juice added. Dissolve sugar in the juice and add the fruit. Boil for half-hour.

Damson, Plum, and **Greengage Jams** are made in exactly the same way as apricot jam, with the exception of skinning the fruit.

N.B.—*Water* is often recommended as being an improvement for making the syrup, but experience has proved that if extra moisture is required it should be in the nature of juices from other fruits.

Gooseberry Jam makes an agreeable change when sweet things are not cared for, and the same method of making is used as before. The addition of lemon juice is an improvement.

Rhubarb, too, makes admirable jam, and is best made in the autumn, when the *sap* is out of the rhubarb. The addition of figs greatly adds to the flavour of this preserve.

Jellies, such as red-currant, blackberry, and black-currant, are made by first extracting all the juices from the fruit by heating slowly and squeezing through a cloth, and then adding one pound sugar to one pint fruit. Boil half-hour.

Vegetable-Marrow Jam.—Peel and cut out the pulp of as many marrows as you wish to preserve; cut them into thick pieces. To every pound marrow add one pound sugar; allow this to stand overnight; add the juice and rind of one lemon to every two pounds of fruit, grating the rind very small; place three-quarter ounce whole ginger (bruised) and a pinch of cayenne tied in a muslin bag; boil all gently for two hours. When nearly finished boiling add a wineglassful of brandy or whisky; this is *added as a means of keeping better.*

N.B.—In making jam of any kind the scum, as it is termed, should *not* be removed, as is usually taught. This is really the sugar, and should be stirred into the jam—otherwise the result will be a thin watery mixture.

Bottled Fruits.—In making jams the sugar is the preserving power, but this is not so in *bottling fruits.* It is the *exclusion of all air which is absolutely necessary* to prevent the fruit decomposing. The great thing is to try to keep the fruit *whole.* Many succeed in bottling fruit so that it is free from mould, but the fruit is generally all *mashed.*

The following is a simple method, and success is sure if the above facts are kept in mind:—

Put the fruit in the glass jars with quarter-pound sugar to each one pound fruit; place these in a cool oven until the fruit is warmed through; remove from oven, and fill up the jars with *boiling water;* next run melted suet on top of this, and cork down; then run sealing wax well over the cork, and store in a cool, dry place. The fruit will be ready and acceptable at any time for fruit tarts and puddings.

Gooseberries, cherries, or plums are very successful treated as above.

Pickles.—Pickles is the term used for vegetables or fruit preserved in *vinegar.* There is always a certain amount of satisfaction in using these home-made preparations, even if it is generally understood that these may be bought cheaper than they can be made.

Pickled Walnuts.—Care must be taken to gather the walnuts before the shell hardens. These are obtainable from middle of July to middle of August, and can be bought at any greengrocer's at about one shilling for one hundred walnuts.

Prick each walnut with a darning-needle, and place in an earthenware pan; prepare a brine made with six tablespoonfuls of salt to one quart water; pour this over the walnuts, and allow to remain for three days; change the brine, and allow to stand other three days; change again, and allow to stand until the ninth day. Remove from the brine, and dry on a tray in the sun, when the walnuts will turn quite black. Prepare a pickle by boiling in half-gallon vinegar two ounces whole bruised ginger, two ounces black pepper, four blades mace, eight cloves stuck in a small onion. Place the walnuts in earthenware jars or bottles, and pour over the vinegar and spices; cover with parchment, and store in cool, dry place, when they will be ready for use in a few weeks' time. This pickle improves with keeping.

Tomato Chutney.—Cut up four pounds ripe tomatoes and one pound apples, one small onion; place in a jar; add two ounces salt, a small teaspoonful cayenne pepper; bake in slow oven until the whole is a pulp; pass this through a sieve, and add three-quarter ounce grated ginger, one pound chopped raisins, two ounces mustard seeds, one pound Demerara sugar, and three-quarter pint vinegar. Stir well, and bottle ready for use.

Pickled Onions.—Peel some small silver-skins with a silver knife to keep them a good colour; place in a bottle, and pour over enough cold white vinegar to cover them, and add spices, one ounce each of allspice and whole pepper to every quart. Onions are fit for use at the end of three or four weeks. They lose crispness if kept too long, so too many should not be done all at once.

Pickled Plums or Damsons.—Place three pounds plums or damsons in a jar, having previously pricked them with a darning-needle; add one pound loaf sugar, with one pint vinegar, half a dozen cloves and one blade mace, one stick cinnamon and half teaspoonful allspice. Place jar and contents in *very* slow oven, and leave until the plums begin to crack. When cold cover down with parchment paper.

Salad Dressing.—Mix the yolks of two hard-boiled eggs with one teaspoonful mustard, a little salt and pepper, half teaspoonful sugar, and add drop by drop half-gill salad oil, also half-gill vinegar. The above will keep for some time. If oil is objected to, then cream may be substituted and half the vinegar. This, of course, must be used at once.

Pickled Eggs.—Among other goods to be stored for winter use are *eggs*, which can be pickled when they are plentiful and cheap, and be found most useful during the months when eggs are so very scarce.

Buy a tin of water-glass at any chemist's; place the eggs (which must be fresh) carefully in a large earthenware bowl, and see that none are cracked; dissolve the contents of the tin of water-glass—or silicate of soda, as it is correctly termed—in boiling water; allow to cool, and cover the eggs with this. On no account pour the mixture over the eggs when hot.

A ROYAL DEDICATION.

A SIGNAL honour has been paid to a recent publication of Messrs. Thomas Nelson and Sons, entitled *Britain Overseas*, by J. Edward Parrott, M.A., LL.D. By special and gracious permission the volume has been dedicated to Prince Edward of Wales. As the book is designed to tell children the story of the British Empire, its dedication to our young Sailor Prince is very appropriate. This is the first time that such an honour has been accorded to any book.

Our Art and Handwork Section.

PAINTERS AND PICTURES.

BY W. E. SPARKES.

IX.—GEORGE CLAUSEN, R.A. X.—L. CAMPBELL TAYLOR.

MR. ANDREW LANG, in his pleasant *Rhymes à la Mode*, happily hits off the characteristic exhibition picture :—

> "In buff and boots the cheery knight
> Returns (quite safe) from Naseby fight ;
> Thy humblest folk are clean and bright.
> Thou still must win the public vote,
> Philistia !
>
> "Observe the High Church curate's coat,
> The realistic hansom note !
> Ah, happy land untouched of blight,
> Smirks, Bishops, Babies, left and right,
> We know thine every charm by rote,
> Philistia ! "

Such pictures as those reproduced this month are not likely to be classed among popular successes. The editor of an illustrated magazine, knowing quite well what pictures are mostly regarded with favour, would take care to select the romantic or the anecdotal, the simpering or the sentimental, the babies and the bishops. For what appeals to the general public (in all the arts) is likely to fall very flat with the artist or the art-lover. One looks for a story that leaps to the eyes ; he is amazed by bright colour, and too often charmed with a gaudy frame ; he likes the sentiment "laid on with a trowel." The other looks for skill and sympathetic insight quite apart from the subject of the picture ; he enters a little into the artist's mind, and rejoices with him in his triumphant success over difficulties.

Pictures naturally range themselves into two wide ranks. They can often be casually judged by the attention they attract at an exhibition. Philistia votes unhesitatingly for sentiment, and plumps for anecdote. Sincerity, too often, has no audience ; and perhaps the note which above all distinguishes such pictures as those by Mr. Clausen and Mr. Taylor from the general run of "exhibition" paintings is sincerity. One feels that the artist is least of all trying to catch the public eye, or is posing for effect ; if he seeks the approbation of any, it is of his fellow artists, or of those whose appreciation, based on knowledge as well as sympathy, is worth "a whole theatre of others."

Paintings differ very widely. It is curious to think how taste changes with the age and almost with the individual. It is sometimes a matter of environment —no man being able quite to escape the feelings of the time in which he lives ; and often, especially with strong natures, it is a question of temperament, so that two men looking at the same view, or turning over the same subject, will differ extraordinarily in their expressions. With some men *form* sways most, while others are given up entirely to the delights of colour ; and this is true of whole nations and ages.

There have been times when *form* was considered supremely important ; when the only righteousness lay in outline, strict proportion, and modulated surface—a rigid and somewhat cold religion ; and there have been ages when colour overwhelmed form—or perhaps it would be more correct to say, when form followed colour as a humble retainer.

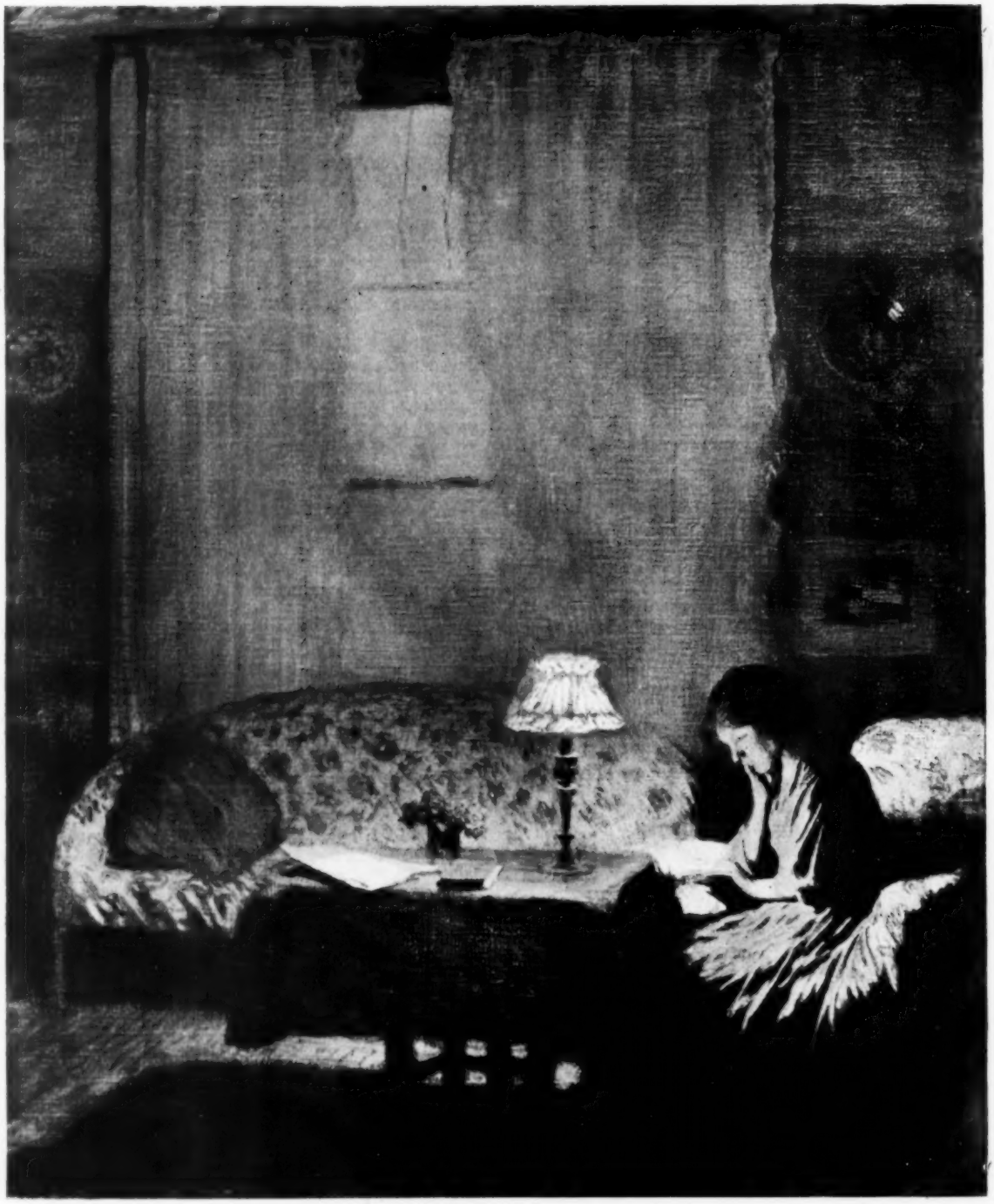
This change in outlook is most interesting. Remember how the Greeks worshipped perfect proportion, fine surface, and exquisite outline. Colour, mainly gaudy colour, was added to marble only to bring out more forcibly its pure tones ; while even those "later Greeks," the great Italians, Michaelangelo, Raphael, and others, laboured first to elaborate the form and the outline.

And there are still men in every nation cold to colour, but delighted with delicate and expressive form—Greeks in temperament to a certain degree.

Colour has always asserted its charms ; even the savage uses wonderfully effective ornament. But fine colour—that is to say, the subtleties which have been learnt by close and loving observation of light playing on flowers or in the sky—belongs to later times. It is safe to say that no ancient Greek saw such glorious colour in Nature as the generations of modern artists have unfolded to our eyes ; for it is the artists who have taught us to see. Even in our own times we have seen new continents discovered beyond those first reached by Turner himself. Turner, beginning with rigid outline in his architectural drawings, ended by painting the prismatic colours that flash through the air ; he became careless, one would think, of form and accuracy. Later, Whistler, with his "harmonies" in blue and gold, his arrangements in colour so much ridiculed because so little understood in Philistia, carried on the discoveries into subtle and delicate harmonies.

And what shall be said of the very modern Impressionists ? What has *not* been said, generally forcibly said with a liberal addition of objurgatory adjectives, about the paintings by Manet, Monet, Sisley, and their fellows ? The mildest criticism was that here were Bedlamites with diseased optic nerves mistaking Nature for a painted jade decked in villainous colour. And yet the wonder of it ! To-day fine colourists everywhere are acknowledging that these madmen could see effects hidden from their keenest-eyed comrades in art. To them colour was everything. They deliberately set their faces against the "beauty" in outline which the Greeks and the modern schools dating from the great Italians had thought the chiefest good. To them purity in colour—the colour that could not be even suggested by *mixing* the most brilliant pigments—was to be had at all costs.

Such extremists are rare. A colourist need not neglect form, and seldom does. For seeing at the same time exquisite beauty in fine form and the enchantment of choice colour, such colourists as Mr. Clausen and Mr. Campbell Taylor combine and harmonise the two ; not throwing contempt upon "subjects," but using taste in selecting those that are pleasant without being mawkish or repellent, and which lend themselves to design and colour.



"A Twilight Interior."

From the Royal Academy picture by George Clausen, R.A.

(By kind permission of the owner, Samuel Wilson, Esq., Rutland Lodge, Potternewton, Leeds.)

Temperament, however, inclines the balance one way or the other. Two artists setting out with a highly-trained sense of form and colour—and both seem necessary—will arrive at very different goals. He may, like Mr. Clausen, be absorbed in the problems of light, in which case colour will naturally be his first choice; or he may, like Mr. Campbell Taylor, be attracted more strongly by form, his colour being kept in a subdued key.

And yet this hardly expresses it. Both artists are excellent draughtsmen and fine colourists. Colour modifies apparent form, and strong sunlight forbids the rigid outline. If Mr. Clausen paints an old reaper in the sun, he surrounds him with brilliant colours which interweave with the bright lights on the reaper himself, and thus suggests the impression conveyed to the mind under a sunny sky; outline vanishes in part, or by a touch here and there is left to the imagination.

Mr. Campbell Taylor chooses interiors where the diffused daylight subdues the colour and shows every person and thing in more definite form.

Yet the harmony in both pictures, built upon very different ground notes and modulating into totally unlike melodies, is delightful. To walk along miles of Academy pictures, mostly protesting too much either in their subject, their handling, or their sentiment, and then to happen on a country girl at a gate, a reaper in the field, or an old sunlit barn by Mr. Clausen, is like a draught of fresh water; and one does not readily forget one's delight at seeing for the first time those two dainty and perfect little pictures by Mr. Campbell Taylor—"Battle-dore and Shuttle-cock," and "A Card Party"—in which was compressed an infinity of patience, feeling, and knowledge, and both quietly beautiful in colour and design.

"A Twilight Interior." (George Clausen, R.A.)

Fine draughtsman as he is, Mr. Clausen approaches Nature as an accomplished colourist. He is strongly related to the French Impressionists, without following their technique, and certainly in opposition to what appears to be their bravado in choosing uninviting subjects merely to irritate the Philistines. He has sought inspiration from colourists of all countries and times; and if one is reminded most strongly of Millet in Mr. Clausen's paintings, it is because he has chosen to select his subjects, in many instances, from the fields, and because, like Millet, he is absorbed in the delights and difficulties of beautiful colour in the open air; while, moreover, both artists have treated their subjects sympathetically, not so much with an eye to teaching, but from a genuine insight into the peasant's life and character. Millet, himself once a farm labourer, paints more acutely the hardships incident to all labour in the fields; Mr. Clausen sees the poetry of country life without attempting to transform his peasants into primitive Arcadians. His reapers never remind one of the professional model dressed for the part and standing wearily on the artist's throne in the studio; one rather suspects the artist of watching the peasant at work in the bright sunshine, and endeavouring to catch not only the critical moment in action, but also every change in tone brought about by change of movement or shifting light in the sky. There is always such a true feeling in Mr. Clausen's paintings, and in none more than in those in which a momentary effect is caught, flashing for a moment and gone.

Not that it is possible to paint these effects on the spot. There must be intense observation at all points—action, colour, atmosphere and its effects on form—all observed singly and in conjunction, keenly felt and afterwards recalled in solitude, the stuff and substance from which afterwards the completed design must be woven.

For Mr. Clausen is much more than a realist. He sees the reaper under certain conditions which appeal to him by reason of their harmony in colour, but he afterwards reconstructs from his mental images, touching everything with poetry; so that one who had no knowledge of drawing, and was not at all interested in tracing where the artist keeps his colours thin or loads his high lights, would be delighted with the simple charm and sincerity of the picture.

"Twilight Interior" is a somewhat new departure for Mr. Clausen. He has shown us the open sunlight so often and so beautifully that we had begun to associate his pictures always with out-of-door scenes. But in this painting he has chosen that delicate moment between the light and the dark, when the air imperceptibly steeps everything in softest blue, gradually deepening until all forms are lost in general darkness or show up against the sky in deep indigo. Before the moment is reached, and while the daylight is still strong, other lights, such as the rays from a candle, burn faintly and almost ineffectively; but as the blue creeps into the room these other lights begin to spread and assert themselves.

It is difficult enough to paint the evening light, but the difficulty is enormously increased when the twilight effects are interwoven with the yellow rays thrown from a candle. A few moments more and this artificial light will overpower the blue in the room, which will retire without into an intense tone, showing deep blue at the window. At present this beautiful colour, this almost peacock-blue, gradating from above downwards, fills the space between the curtains, and also filters through them in delicate tones, showing tenderly against the grays into which these hangings have resolved themselves; it touches the newspaper on the table with a mauve-violet tinge exquisitely effective in carrying out the scheme of blues in the design.

The picture resolves itself into what Whistler would probably have called a "harmony in blue, green, and gold." Yet this is without losing the sense of poetry, a sense of absolute rest and peace. The quiet occupation of the girl, the quietly disposed room, the simple furniture, the absolute sincerity throughout, all combine to that happy result. But the art-lover is delighted with the masterly skill with which the colours are harmonised—blue, green, and gold. The walls are tinted with an almost invisible gray-green, which is carried on in stronger tones on the cushion, culminating in the bright green book lying on the table. The gold tints strike their strongest note in the bright shadow over the candle, intensely vivid against the dark blue sky at the window. It spreads in a deeper tone, yet still light in key, over the book held by the reader, passing then into a rich golden brown where the light shines on the girl's dress. The shades on the dress deepen into fine browns in the shadow behind the chair and on the wall, while it implicates with the green scheme by means of the green-brown table cloth—an intermediate colour happily contrasted with the lilac flowers in the vase on the table: a secondary harmony in broken tints.

"Bed Time."

From the Royal Academy picture by L. Campbell Taylor.

(By kind permission of the Artist.)

Such a picture as this gives one the delight that comes from seeing rich enamels or deep-toned Indian vases placed among gold brocades and green silks: it is a feast in harmonious colour, a skilful setting which brings out the beauties by contrast or agreement. It will be seen from this imperfect description that the strongest colours glow in close neighbourhood—the bright yellow standing in strongest contrast against the deepest blue, and, below this, the insistent, telling green of the book-cover.

As a mere colour scheme, quite apart from the subject, the results are triumphant. But its chief beauty lies in its exquisite rendering of natural and artificial light interweaving, contrasting, touching here and there in the daintiest fashion, and playing into each other in the reflections. And there is an added pleasure: all this skilful painting is not merely an exercise in handling, but it is controlled by a feeling for the poetry of the moment; it expresses an emotion, and is a revelation of temperament. It shows the artist moved by the supreme beauty of a transient moment—a beauty which he felt intensely, and which he endeavoured to suggest to us by all the means in his power.

The delightful freshness in Mr. Clausen's painting and his purity in tone are always admired by students. Here is a master able to get his effects with a directness that comes from intense study and unceasing practice. The French Impressionists have insisted that shadows are luminous, and that the tenderest colours and subtlest combinations which result from reflections into the shadow should be therefore expressed by thin painting; quite in opposition to much former practice when men looked upon shade as blackness, and painted accordingly in heavy tones. Mr. Clausen uses a rough-grained canvas, as you may see by looking at the photograph, and in this the tiny valleys between the threads show up through the thinly-painted shadows with fine effect; they help to express atmosphere and delicate modulation in colour.

In drawing, fine draughtsman as he is, Mr. Clausen does not follow Ingres or Burne-Jones, who both drew outline with such supreme grace and refinement. His is a more robust manner. He obtains his form through colour, subordinating details and outlines to broad effects, as you may see by looking at the hands in "Twilight Interior," the fingers being merely suggested, and yet the action and the appearance under light admirably caught.

It is indeed this scholarly manipulation and this knowledge founded upon intense observation which, together with his poetical outlook, far enough removed from the anecdotal, combine to make a picture by Mr. Clausen a liberal education to the art-student and a constant joy to the man who can appreciate a highly-gifted artistic personality expressed strongly, as it is in "Twilight Interior."

"Bed Time" (L. Campbell Taylor).

Mr. Campbell Taylor is an excellent colourist, though he works in a lower key than Mr. Clausen, choosing rather to paint diffused daylight in interiors than the stronger effects to be seen in the open air. But within the limits of his restraint he paints admirably. It is said that Millais would distinguish a dozen tones in white where other men (in his day) could see only two. Velasquez painted in a much lower key than Millais, but he was magnificent also in the wide scale of colour he distinguished within the limits he imposed upon himself. He could give character to still life by his wonderful rendering of texture.

Mr. Campbell Taylor has learned a very great deal from Velasquez and from Rembrandt. He has selected the early Victorian period for his own—a daring selection, one would think, hampered by impossible crinolines and outrageous furniture. Yet he has touched the age with such delicacy, such refinement, that these impossibilities have taken on the beauty which no doubt they wore in the eyes of our grandparents. One recalls his delightful "Battle-dore and Shuttle-cock," a picture in which a few early-Victorian ladies are gracefully but quite naturally disposed about a sober room, themselves in admirably appropriate setting. It is a small picture, but the style is so large, the design so ample, that, like Samuel Cooper's miniatures, it contains the elements of a large canvas.

"Bed Time" is a characteristic work. There is only a small range of colour, at first sight mainly black and white, but the artist's skill and insight show themselves in the large play he makes within such a restricted area. Look, for instance, at the white tones in the picture. At a casual glance one would miss the wide variety the artist has expressed with convincing success. The old nurse's cap differs entirely from the ivory-white of the silk shawl thrown over the chair-back, and this again from the baby's robe, which is touched with a bluish tinge, delicately harmonising with the blue and pink-tinted white of the lady's dress. There are more decided changes in the green-flushed lily and in the bluer earthenware. All these various notes, in the wide scale, colour each other by their neighbourhood; yet all keep their basic effect of white contrasting strongly with the darker furniture and the nurse's dress with the intermediate gray walls bridging the violent gulf between black and white.

Mr. Campbell Taylor is an admirable draughtsman. Like Millais and Velasquez, he is a painter of men and women, with a skill in portraiture which will inevitably be recognised more widely in the coming years. He has that excellent and vital power of painting the soul in the face; aiming at character rather than mere accuracy in line, he makes his creations live. Not only that, but his paintings are "all of a piece;" he has learnt from Rembrandt that the hands are next in importance to the face, and he distinguishes between them in character. It is needless to point out how admirably all the hands in this picture are in keeping and how well they are drawn.

This bent towards realism puts him in a school apart. There is a whole world between his art and that of Burne-Jones and Rossetti, and their followers who paint scenes in Camelot.

> "In Camelot how gray and green
> The Damsels dwell, how sad their teen,
> In Camelot how green and gray
> The melancholy poplars sway.
> I wis I wot not what they mean,
> Or wherefore, passionate and lean,
> The maidens mope their love between,
> Not seeming to have much to say,
> In Camelot."

And while he has no dealing with Camelot, he flies from Philistia—flies equally from dreamy abstractions, and from the sugared sweetness of the sentimental school. He finds in Nature a sufficient field for the greatest art; and if he is attracted more by temperament towards form and character than by brilliant at-

mospheric effects in colour, he finds himself in high company. This fine drawing is everywhere apparent, while his modelling of surfaces—as in the shoulder of the mother, and in all the hands and faces—is masterly.

Moreover, Mr. Campbell Taylor has that decorative sense and feeling for design which distinguished all the great portrait painters—a largeness in spacing, and an instinctive regard for balance in tone and line. In "Bed Time" he appears to have set himself an impossible task, only to prove how easily he could solve it. The baby is, of course, the centre of interest, but one would think that he would be lost among so many strong, contrasting, and spacious stretches of black and white. Yet he emerges, placidly open-eyed, the most important person in the picture, finely indifferent to his success.

The art of this is so concealed that one has to search to discover how carefully the artist has arranged his group to bring about this happy result. Let me mention a few points among many. Nurse and mother both look towards the baby, and so compel attention: the hands and arms of both lead to him; the portrait on the wall stands immediately above him; the upright lines on the wall make a cross with the horizontal lines, and at the centre of this cross is the baby's head. The lily is not only useful in giving depth to the picture, but it leads, by way of the nurse's hands, towards the child's head. There are many other things that might be mentioned in the same connection—the golden lights in the mother's hair, the brocade on the sofa, the colour on the shawl.

But, after all, while it is interesting to trace the lines upon which the artist appears to have worked, one must not forget that rules are of little use without taste. Mr. Campbell Taylor has an inborn sense for arrangement, just as he has a natural gift for distinguishing character. It has been remarked that Velasquez's "still life," his earthenware, drapery, and furniture, had a certain nobility which distinguished it from the common; others have said the same about Chaudin's pots and pans; a strong painter like Mr. Brangwyn or Mr. Clausen gives character and distinction to a basket of onions, a dish of fruit, or a glass of wine; and Mr. Campbell Taylor's painting of china, furniture, and drapery is another evidence of his insight and skill.

Mr. Campbell Taylor paints youth and old age, men, women, and children, with equal facility. He informs all with a living spirit quite foreign to the painter who merely paints his model; and there is a delicate refinement in all his pictures which reveals itself in the smallest particular—in cups and saucers, in scarves, bows, and flowers.

DRAWING IN PUBLIC SCHOOLS.

I.—GROVE ACADEMY, BROUGHTY-FERRY.

BY W. RYLE SMITH.

Higher Grade Department, Part I.

THE drawing in the higher grade department is for the first three years almost entirely in preparation for the Intermediate Leaving Certificate, and the scheme of the work is as follows:—

1. Nature drawing: garden and wild flowers, trees, etc. 2. Design for specific purposes. 3. Landscape silhouettes. 4. Imaginative drawing. 5. Object drawing: pencil tone drawings of objects singly and in groups of two or more with background. 6. Scale drawing.

The post-intermediate work consists of fuller representations in colour of groups of fashioned articles and natural objects with suitable backgrounds, in some cases draped.

Specialisation in one or more of the following or similar studies:—(1) Tree buds and branches, a progressive series of drawings; (2) fruits; (3) butterflies, birds, shells, etc.

Design similar to that of the intermediate stage. The classes of the intermediate stage vary in number from thirty to forty. The class beyond that stage is usually from twenty to thirty.

The time allowed for drawing is two hours per week.

The room devoted to the work of the higher department is specially constructed for the teaching of art. It measures 48′ × 22′, and has accommodation for forty pupils sitting at single desks. The desks are light, and can be easily moved and arranged to suit the various kinds of work. The room is lighted by windows on one long side (the left) and by roof-lights on the same side; the windows on the wall are fitted with specially cased blinds that pull *up*, the roof-lights with similar blinds that pull *down*—consequently lighting is well under control. The wall blackboards measure altogether 40′ × 4′. There is also a permanent lantern screen fixed behind the teacher's blackboard. The screen is composed of Keene's cement, and is painted white; it is arranged at the proper angle for the lantern. When the screen is in use the teacher's blackboard sinks down into the floor quite clear of it. The room can be darkened and the lantern set agoing in the matter of ten minutes.

Nature drawing bulks next in importance to object drawing in our scheme, and consequently receives a considerable amount of attention. Expression has already been given to the very great care necessary in this kind of work to prevent looseness of execution, and this care has to be constantly exercised, or else the results obtained from the majority of pupils will be valueless.

Pencil drawings are the rule to begin with again at this stage, and the utmost attention is demanded for minute details. Difficulties of reproduction unfortunately prevent us from here showing specimens of the delicate pencil work which is aimed at. The examples shown are either in a more robust style or in colour.

Nos. 4, 7, 9, and 10, Plate I., are by pupils in the first, second, and third years of the intermediate course respectively. The bulbs shown always prove interesting studies, and tree fruits can be obtained in great variety of form and colour.

The other examples on Plate I. are all by Junior Students, who in England correspond to senior Pupil Teachers. Studies of butterflies are often asked from

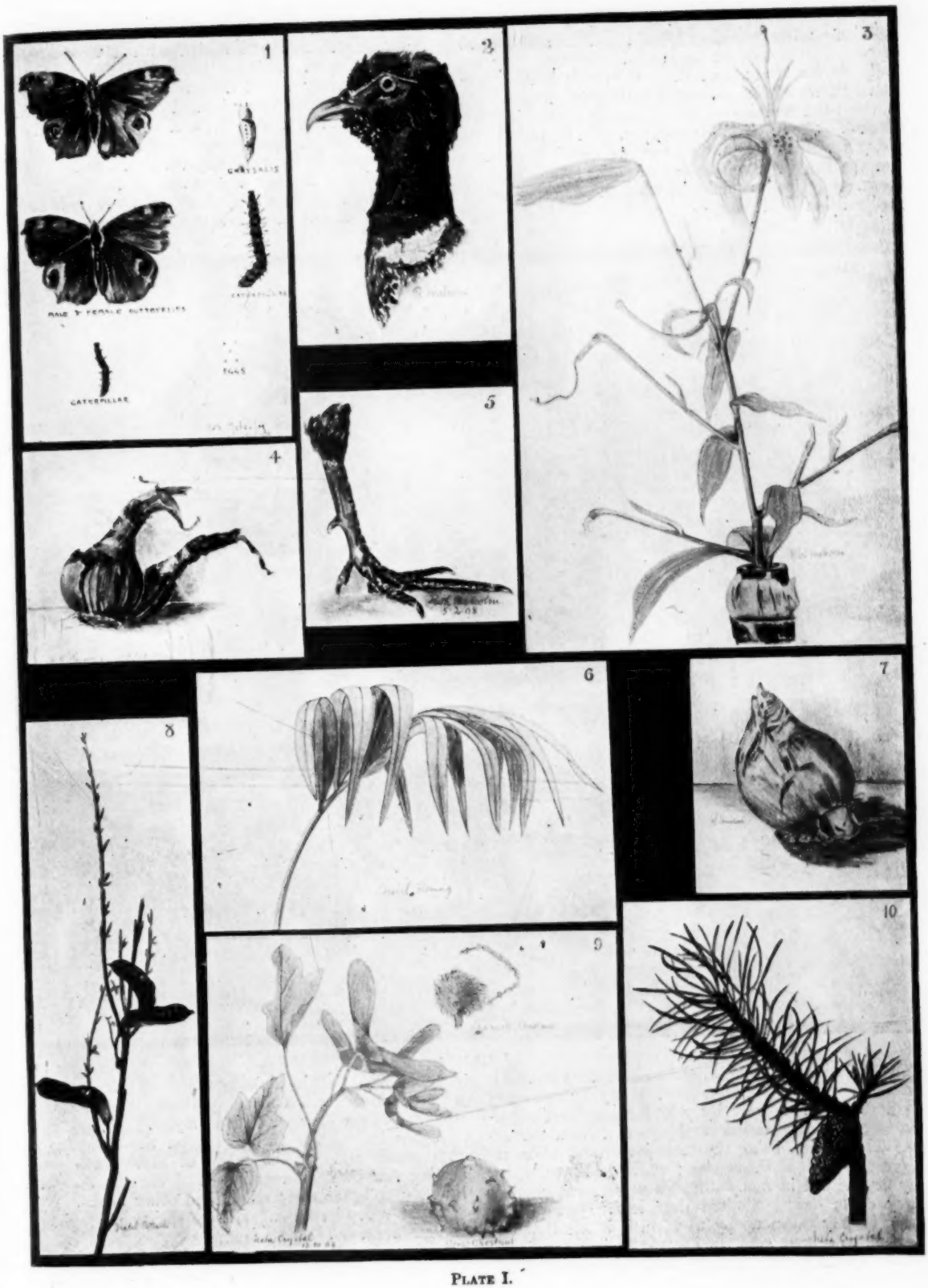


PLATE I.

young children, but we have to admit that they can only be satisfactorily treated by pupils of considerable experience; the same may be said of drawings of birds. In regard to the latter, as stuffed specimens only are available for study, and these as a rule indifferently mounted, we confine ourselves entirely to details, such as the head and leg of the pheasant shown in Nos. 2 and 5. The lily (No. 3), palm-leaf (No. 6), and broom pods (No. 8) in Plate I., also the two drawings of fungi and the three representations of shells (Plate II.), are shown as typical examples of what the more advanced pupils delight in depicting.

majority of the pupils have had more or less practice in space filling. We therefore endeavour at this stage to direct our pupils to design with a view to some specific purpose. It is not insisted on that each pupil should at every lesson design for the same purpose, although the same flower is used by all. See the tulip in Nos. 3 and 4, Plate III., and the poppy in Nos. 8 and 9. Conventional forms have been adopted for the examples in silver and enamel, Nos. 5 and 6.

Lettering is another department of drawing that we only take up at rare intervals. As a rule it is in the first year of the intermediate course; and the block,

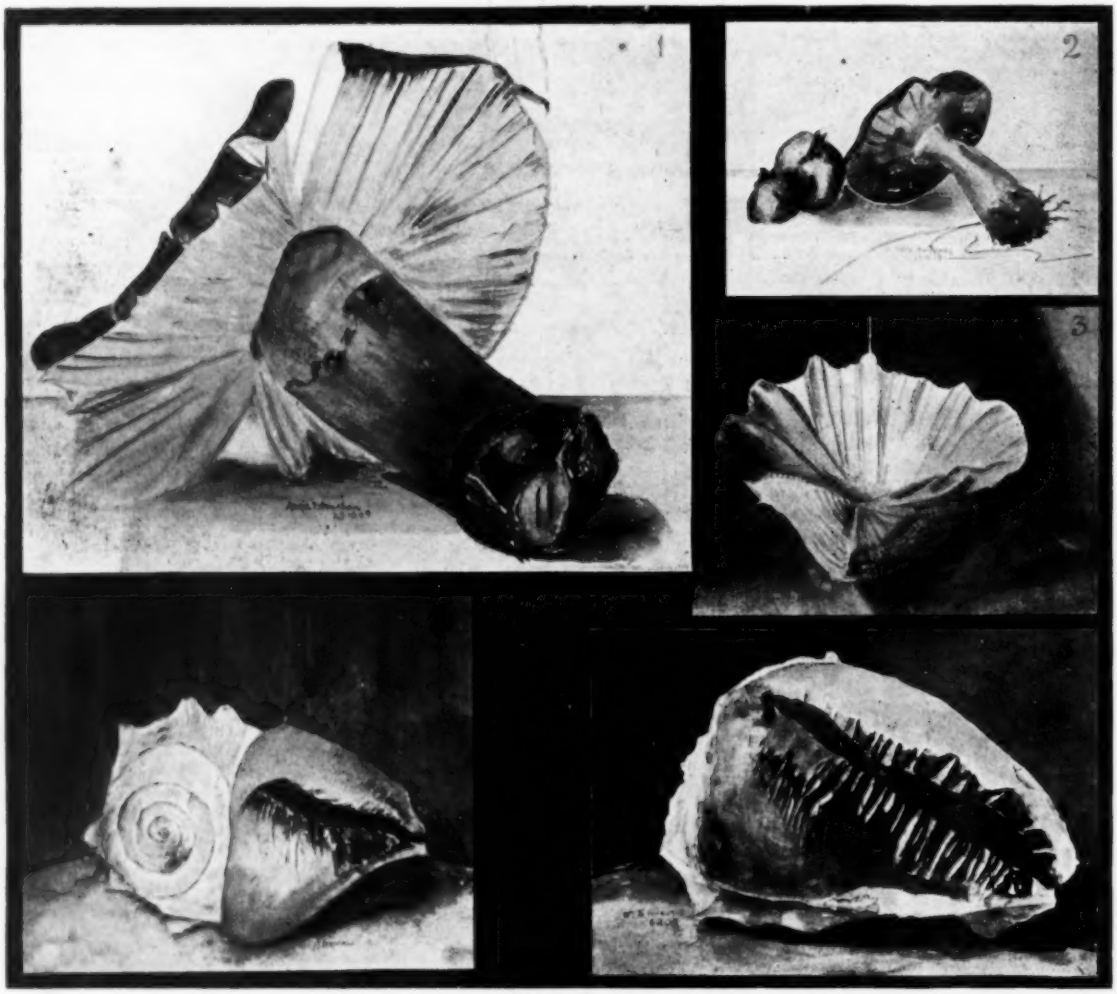


PLATE II.

The inclusion of design in the intermediate course is now a question of considerable difficulty by reason of the demands made year by year for increased attention to the representation of objects and Nature drawing. The former, being the more important, takes up the greater part of the session; while the latter, which may be pursued in many different ways, makes a very heavy claim on the limited time left: consequently design is only taken up by us when it is felt that the time can be spared from the above-mentioned subjects. Before reaching the higher grade department the

Roman, and Gothic alphabets are the ones usually selected, after which a motto, proverb, or quotation is executed in one or other of these styles.

A few lessons are then given on the designing of monograms and stencils made of same, each pupil cutting his own monogram. The stencils are used by the pupils for their school and other books. Nos. 9, 10, 11, and 12 on Plate III. are shown as specimens of what are done.

Imaginative drawing is given only very occasionally. The choice of subject is sometimes left to the pupil;

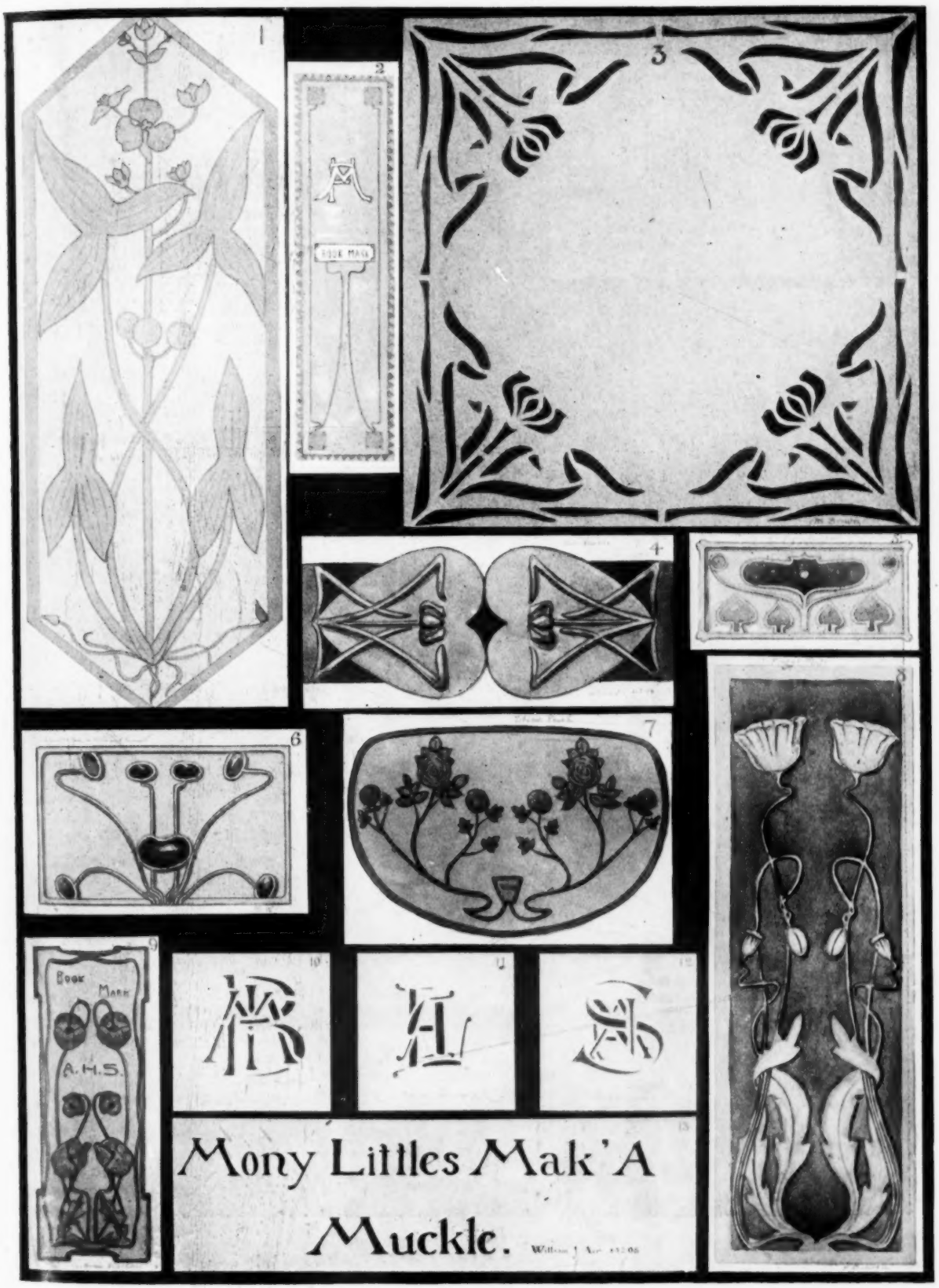


PLATE III.

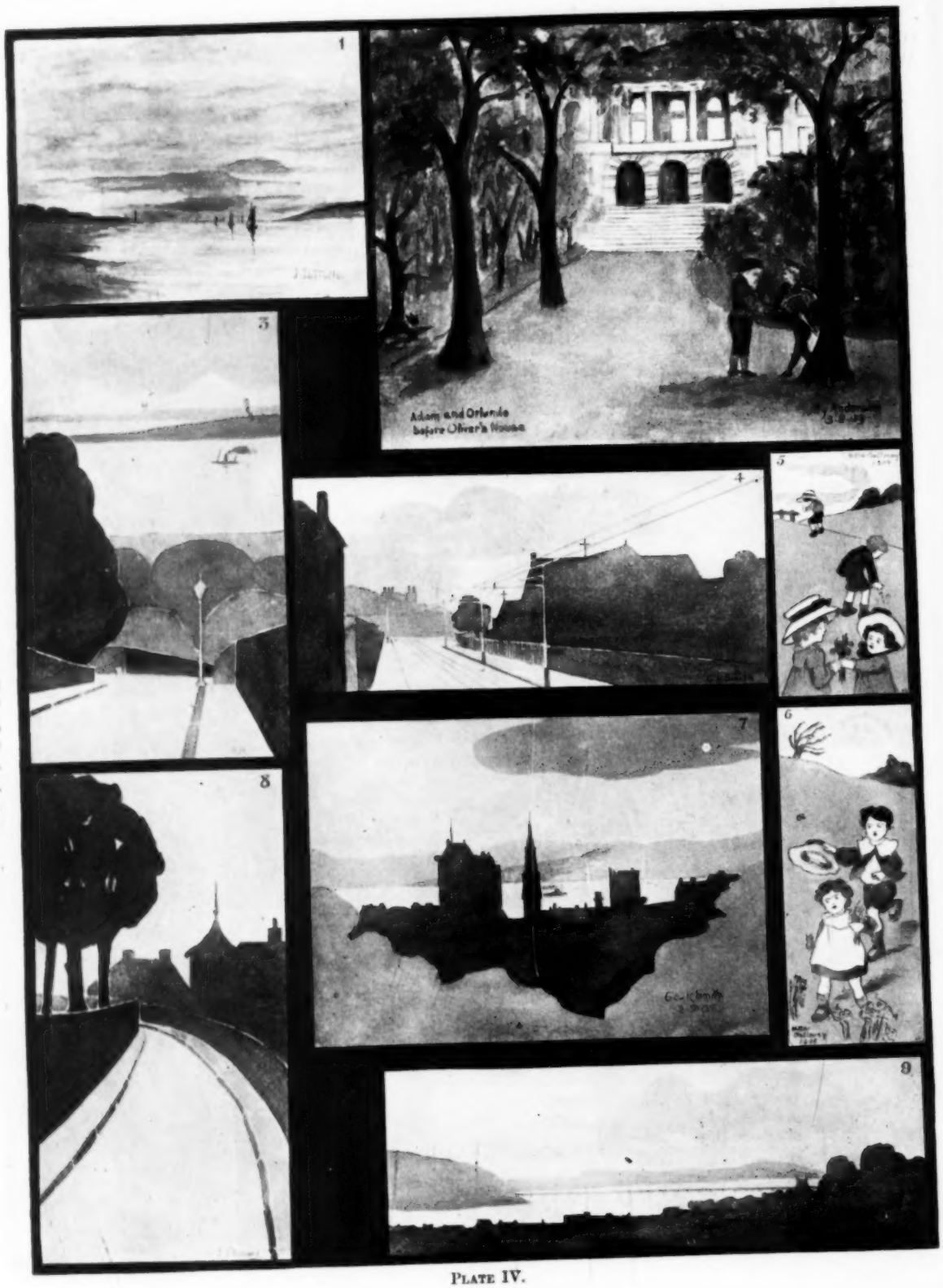


PLATE IV.

but as a rule passages are selected for illustration from the works of the English author which they may be studying at the time. No 2, Plate IV., is from *As You Like It* by a pupil in the second year's intermediate class. No. 1 is an example of a "Sunset on a River" by a second-year Junior Student, and the two sketches of children at play, Nos. 5 and 6, are by a first-year Junior Student.

We find that pupils grow more and more *shy* at this kind of exercise the older they get, not because of a lack of imagination, but rather of a lack of executive ability. A subject such as No. 1 is attempted by nearly all the members of the class, especially if they have had experience in silhouettes; but with such a subject as No. 2—where figures have to be introduced—probably only twenty per cent. of the class will attempt it. The student who drew Nos. 5 and 6 is in a class by herself. Although the results from the imaginative drawing exercises seem to be somewhat meagre, yet we are of the opinion that it is worth devoting some time to it, if only for the purpose of discovering talent which otherwise would remain hidden.

The silhouette exercises are eagerly taken up by the pupils, and are produced from sketches made by them during walks for the purpose in and about the town, or from the windows of the school, and are meant as an introduction to landscape painting.

The sketches are made by the pupils in a standing position as a rule, sketching-stools being rarely used. The time taken to the sketches varies from half an hour to an hour. They are afterwards carefully reproduced in the class, suggestions being given regarding the depth of colour to be used for the various planes, so as to produce the best effects. The most of the outdoor work has been done in the evenings, the best results being obtained in the absence of sunshine. The five examples shown are all "bits" of Broughty-Ferry.

THE HISTORY LESSON AND DRAWING.

BY W. H. ELGAR.

III.—THE ANGLO-SAXON PERIOD.

As with Roman relics, the majority of Saxon remains have been obtained from graves, but with this important difference—all the articles from Saxon graves might be described as personal, peculiar to the individual there buried, while those objects found with Roman interments might have been selected from among the vessels, etc., in use in the house at the time of the death. Of course there are exceptions to this rule, but it is a good working hypothesis.

It is surprising how in keeping this is with the Anglo-Saxon character and manner of fighting, individual strength, prowess, and skill, in contrast with the Roman perfection of military discipline.

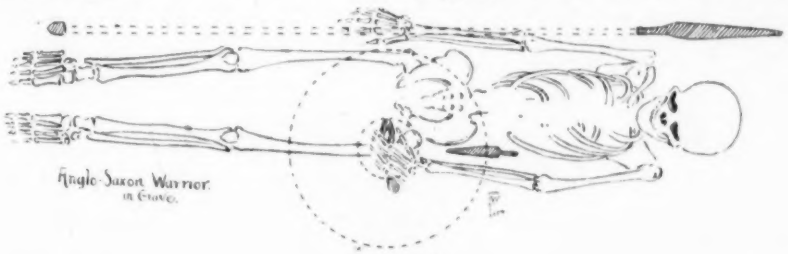


Fig. A.

The man had his weapons and implements peculiar to himself buried by his side—spear, sword, shield, axe, or reaping-hook, sometimes even his horse. The woman was still adorned with her beads, brooches, and jewellery. Men often had their drinking cups or buckets interred with their bodies; and we find both ashes from cremations and whole skeletons of the Saxon times, though burning was much more common in those parts settled by the Angles, and was comparatively rare in Kent.

The mode of interment of the Saxons was quite distinct from the Roman, and doubtless is the prototype of modern graves, with these distinctions—no coffins were used, and the body was fully dressed in ordinary clothes and surrounded by a number of purely personal articles. Even in a vast number of instances the feet are more or less easterly in direction, and we know that a mound of earth was raised above each much in the same manner as in country churchyards at the present time.

Although the mass of the people were buried in cemeteries, great chiefs were often placed in isolated barrows, generally on elevations overlooking the sea. ("Beowulf's Request to His People," *Beowulf*, line 5599, etc.).

Our first illustration (Fig. A) is a sketch of a Saxon skeleton unearthed with about thirty others two years since on the north side of the road between Folkestone and Dover. The drawing was made looking directly down upon the remains, which fact accounts for the dropping forward of the skull. Under the bones of the left hand is seen the brace or handle by which the shield was grasped. This brace crossed a circular hole in the wooden shield (dotted in our sketch), which hole was covered by an iron hollow boss (umbo) riveted to the wood.

Figs. 3, 9, and 9*a*, Plate I., are drawings of shield bosses. Fig. 9, the writer believes, was the identical one which covered the hand of our first sketch. Its six studs still retain their plating of silver. These bosses are of many designs—conical, lemon-shaped, and of double curvature—but those in a fair state of preservation make good objects for children's drawings, and most fair-sized museums contain examples. Perhaps it is best to treat such an object as this in the plan and elevation method of sketching (Figs. 9 and 9*a*) rather

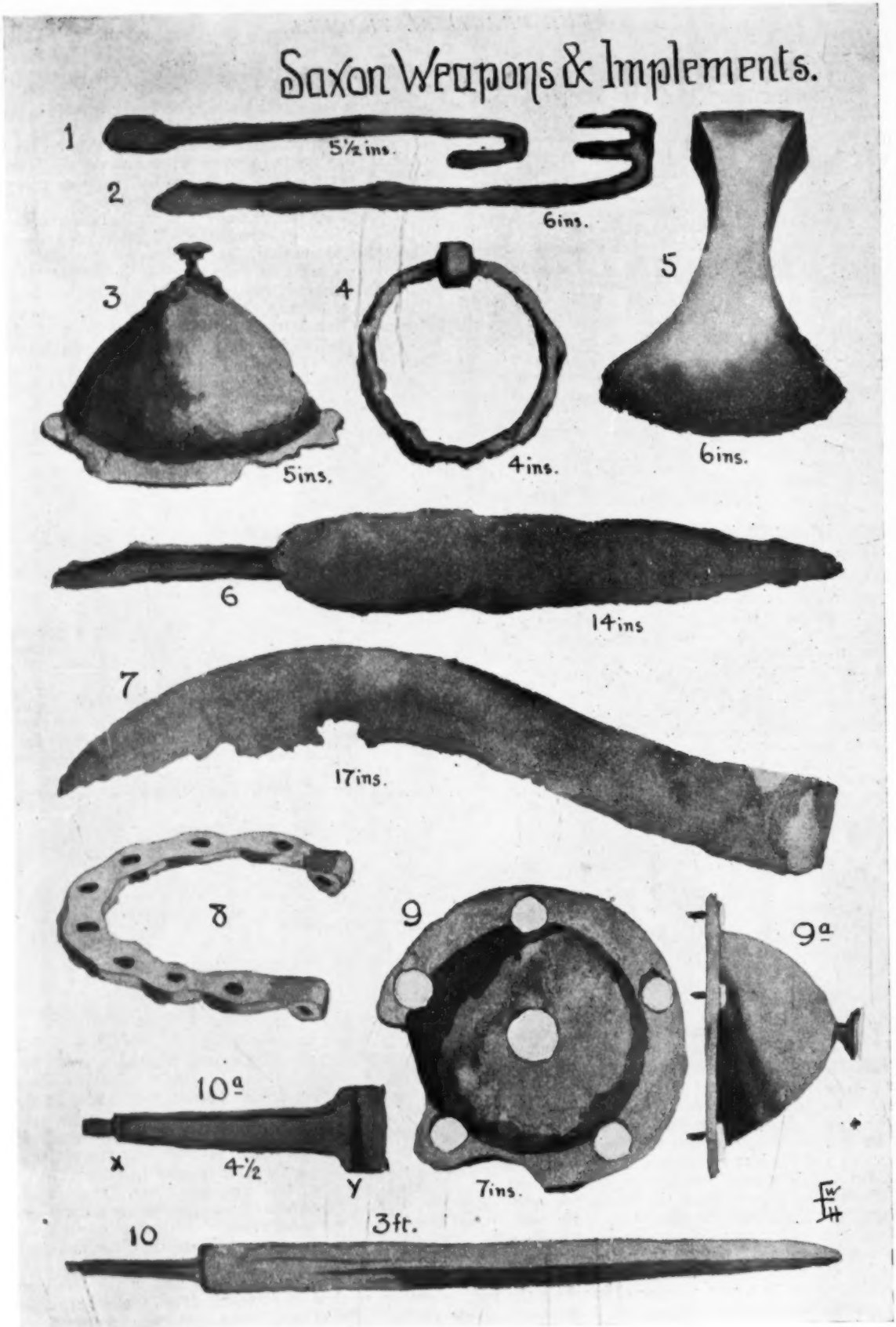

Saxon Weapons & Implements.
1
5½ ins.
2
6ins.
3
5ins.
4
4ins.
5
6ins.
6
14ins
7
17ins.
8
9
9a
10a
x
4½
y
7ins.
10
3ft.

Plate I.

than as Fig. 3, for this sketch would be very indistinct in outline only, whereas the other method is plain, however rough the drawing.

Our skeleton drawing also shows the spear-head and knob at the bottom of its shaft, as well as a dagger which was in the closely-fitting belt. Various buckles indicated where the clothes were fastened, but these are not sketched, for the writer cannot be quite certain as to their positions. The spear-head is drawn as Fig. 6, Plate I.

Often a sword is found on the left of the skeleton. One is sketched as Figs. 10 and 10*a*. They are generally double-edged, three feet long, and without hilts, as the hilts were often of perishable material. Occasionally they have been discovered, and then generally consist of two sets of small flat plates riveted at the top and bottom of the handle at *x* and *y* in Fig. 10*a*, the space between being wound with cloth or leather, and a ring was provided to attach the weapon to the belt. Such swords, it is well to remember, are specially suited to the Saxon manner of hand-to-hand, somewhat irregular fighting; and it would be instructive to draw one side by side with a modern cavalry sword, which is designed for cutting up a disorganised section of an army.

It is not very often that axes are discovered in Saxon graves, but those found are all of a similar type to that shown as Fig. 5. The hole in this one is not cleared out for fear of breaking the weapon; it can, however, be clearly traced near the thick upper end. This axe is not absolutely symmetrical—the curve to the left is longer and flatter than that to the right. Most Saxon axes show this peculiarity in a marked degree. Such an axe-head might be added to the axes described in our first paper were a comparative series being sketched.

The sickle (Fig. 7) does not indicate the manner in which its haft was attached, but its similarity to modern ones should be noted, only the curvature being much less. Doubtless sometimes the horse was buried with its master, parts of bridles and horse-shoes being discovered. The ring (Fig. 4) might have been part of a bridle, or perhaps was used to secure the animal to a post near the grave. A horse-shoe is sketched as Fig. 8. It seems to have been made of flat bar iron, the ends being turned over to secure a good foothold, and the holes being punched, causing the swellings at the edges.

Two iron articles, often found in numbers (Figs. 1 and 2), are drawn because they are supposed to be keys. What must the locks have been like?

A few typical ornaments and other things form our second plate. The most frequent of these ornaments are beads—of glass, amber, terra-cotta, or earthenware. Often one amber bead only is found, being worn as a protection against witchcraft. Those strung as Fig. 1 are mixed, principally earthenware. Notice especially those striped and blotched. The second string contains some amber beads mostly nearly round; while a fine glass polychrome bead is Fig. 3 (deep blue, red, and white). Fig. 4 is a cylindrical yellow earthenware bead, banded irregularly with waves in red and blue. The double truncated conical one (Fig. 5) has had little red discs let into its pale green surface. It need not be pointed out what comparatively easy and yet splendid exercises in colour matching a few of such beads as these would make.

By far the most beautiful personal ornaments are the gold fibulæ (brooches or buckles). One is sketched (Fig. 8) of the circular variety, the kind worn by the Jutes. Four circular studs, with a ruby in each, and six rectangular garnets—three large radial and three small in the rim—are secured by dark rims to a gold disc about two inches in diameter.

A plainer and smaller circular fibula, having a plain turned-up rim so as to resemble a saucer, is supposed to be peculiar to the West Saxons; while a totally different form, in the shape of an irregular cross of bronze or brass, elaborately ornamented, was largely worn by the Angles.

Two small bronze fibulæ resembling our modern buckles (Figs. 6 and 7) were found in graves near the skeleton described above. A broken rectangular lead one is drawn because of its comparative rarity.

The perfection of this jewellery is astonishing, and makes many of us wonder what the Saxon tools were like which fashioned it.

Often a collection of small articles, like a chatelaine, is found attached to the girdle of a lady—a small knife, a pair of scissors, tweezers, picks for various purposes, and keys, and often the metal frame of a little bag.

A pair of bronze tweezers (Fig. 11) of Saxon make shows how very little the form of this article has changed. The twisted bronze wire (Fig. 12) held a number of small articles together. Rather clumsy are the two bronze pins (Fig. 10), but almost identical in shape and size with those of to-day. Fig. 13 is a small pendant made by strapping two clear yellow glass-like stones together with a band of bronze.

An idea of the Saxon's skill as a glassworker may be obtained from our three examples (Figs. 14, 15, and 16). The first example is a well-known and often illustrated one, but up to the present the writer has never found it correctly represented in a drawing. Discrepancies noticed on comparing various cuts in books led to a visit to Canterbury Museum, where this fine drinking-cup is preserved. Hardly any of the drawings showed the depression in the centre, and all of them were very clumsy. The claw-like ornaments were all shown with hollows under, standing free from the sides, whereas several of them are entirely in contact with the body. Round the top and near the bottom long threads of glass are twisted, a characteristic of Saxon work; they are found round the neck of the little glass jug (Fig. 16).

Another drinking-cup (Fig. 15) from the same museum, and of a light amber colour, has a different application of the thread ornament in thin strips passing vertically down and meeting in a point at the bottom, every other strip being chopped in the toothlike manner we noticed when speaking of a Roman bottle last month.

The beautiful colours of this Saxon glass are very striking, and the same rather dull effect noticed in Roman glass is also found here, due perhaps to partial decomposition. The elegant forms and slight irregularities make these objects very subtle and fascinating studies for older scholars.

A fair amount of Saxon pottery remains, mostly pots and cups and a kind of pitcher, differing very little from those at present in use; but none has been included in the illustrations, partly from want of space, partly because it is desired to treat only the most characteristic of the remains of the various periods, and because no attempt is being made at writing a handbook of archæology, but only suggesting suitable objects of study, and at the same time giving just sufficient information about them to make them intelligible.

Saxon Ornaments & Glass.

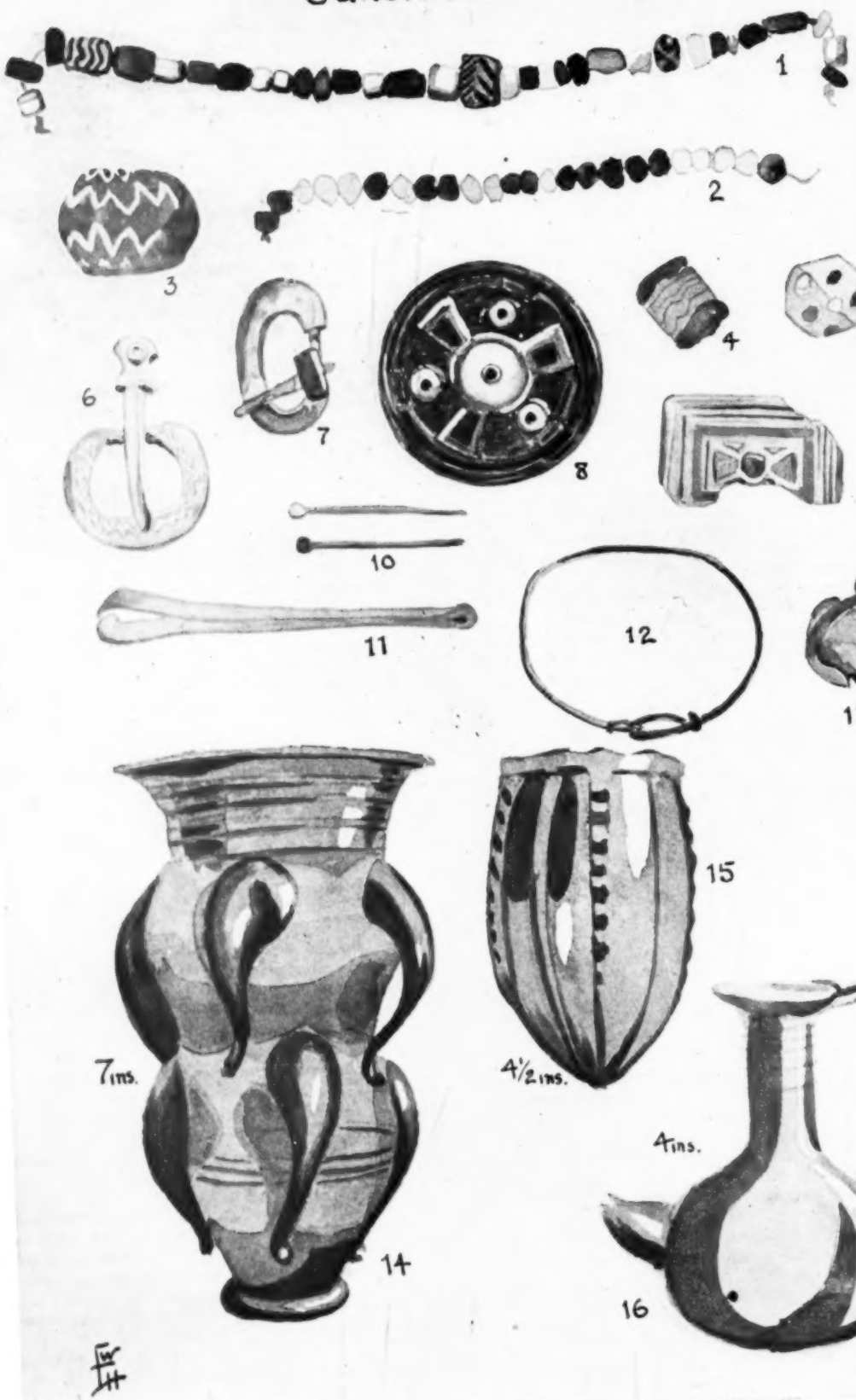


Plate II.

Saxon buildings are not very numerous in this country. A few churches contain portions of Saxon work, the characteristic long and short work at the angles, herring-bone work (a little bit shows at the bottom of the Saxon window sketched), and the wide joints being the most easily recognised points. These were fairly well treated in the papers on "Architecture for Teachers" which appeared in the *Practical Teacher's Art Monthly*, to which the reader is referred.

A rapid and effective way of sketching such work is with black and white chalk on brown paper (Sketch B). Even then it is best to add rough approximate dimensions, and to make a note stating exactly in what part of the building the feature occurs.

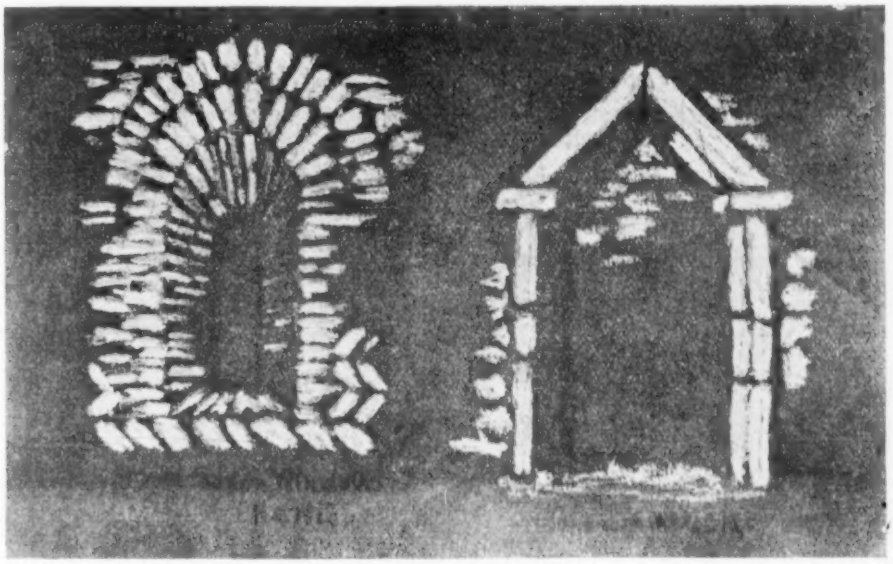


FIG. B.

Practical Upholstery. The Woodworker Series. 6d. (*Office of "The Woodworker," 33 Furnival Street, W.C.*)

The present issue makes the twelfth handbook of this useful and practical series. It deals with the whole science and art of upholstery. As in the previous books, the contents are marked by the great practicability of their nature. Everything connected with upholstery —tools, joinery, framing, stuffing, covering, and trimming—are all exhaustively dealt with. The book will not only be useful to the tradesman, but it contains useful hints and information for every householder.

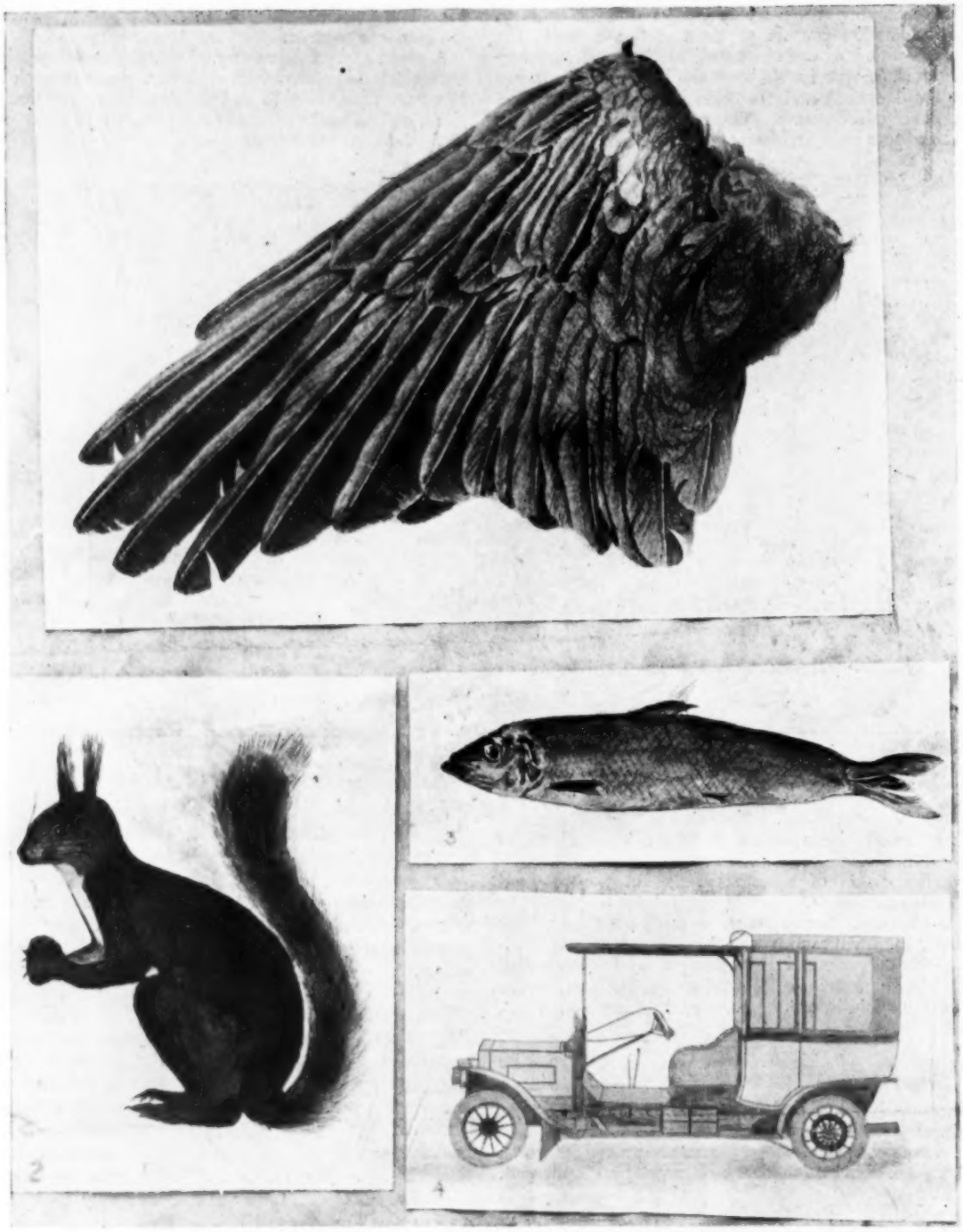
A Handbook of Plant Form. Second Edition. By Ernest E. Clark. (*B. T. Batsford, 94 High Holborn.*)

It seems but a short time ago since we wrote most favourably of the first edition of this book. The fact that a second is soon called for amply proves its worth and utility. The present issue is revised and enlarged, but the strong, truthful drawing of the various plants illustrated still remains an outstanding feature. For students merely to look at the accurate yet artistic drawings, in simple black outline only, is an education in itself. Every plate is an object lesson in both strong and delicate line work, while the fidelity to Nature cannot be too highly commended. It is essentially a students' book, and one that can be recommended and relied upon with the utmost confidence.

EDITORIAL NOTES.

FOR the first time in the history of this paper we are enabled, by kind permission of the owners, to give reproductions of excellent examples of current art. Many teachers will doubtless visit the Royal Academy before it closes in August, and Mr. Sparkes's full and sympathetic explanation of the two pictures will be a great aid in interpreting not only these two but many others.

The number of drawings received for the Honours Page is steadily increasing; but where we now receive tens, we should be glad to receive hundreds, and considering the amount of drawing done in primary and secondary schools this should easily be accomplished. The children, we know, would gladly send in work if they received some little encouragement and suggestion from the teachers. The number of prize drawings shown each month is necessarily small, and only represents a very small portion of the work sent in. We have therefore decided to give each month a list of pupils whose work, while not up to the "Honours" standard, is worthy of commendation. This will give them encouragement to make a greater effort to succeed. The first list of commended work will be given next month. We hope to get a large number of holiday sketches.



HONOURS PAGE.

THE following pupils have gained honours this month:—

1. H. Martin (12), Mantle Road Council School, Leicester.

2. J. Easton (14), Tillmouth Council School, Northumberland.

3. Frank Nickall (12), Haugh Shaw Council School, Halifax.

4. Harold Orrey (11), Alfred Street Council School, Lincoln.

No. 1 was an excellent pencil study, the texture of the feathers being capitally rendered. No. 2 was a particularly careful study in colour, remarkable for so young a boy. No. 3 was a very good colour study, the head being specially well treated.

NOTES AND SUGGESTIONS ON THE TEACHING OF EXPERIMENTAL SCIENCE, MATHEMATICS, AND DRAWING.

BY C. HAMILTON.

(*Continued from page 35.*)

Section VII.

SO far the students have been led to regard a formula as a "shorthand" statement of numerical relations. The aim of this section will be to secure greater facility in the manipulation of symbols.

Addition and subtraction may be illustrated by considering the case of a man walking east and then west. After a few simple numerical cases have been taken, a more complex one, involving the use of brackets, should be given. A similar problem should then be set in which the distances are *a*, *b*, *c*, etc. Attention should be called to the effect of a negative sign in front of a bracket on the sign within the bracket, and a few examples worked on removal of brackets, addition, and subtraction. The exercises worked at this stage, however, should be few and easy, and perfection of dexterity should not be aimed at. Future exercises will give plenty of practice, and the growth of the power to work in symbols should be gradual. Moreover, exercises of the type under consideration only lead to mechanical dexterity; they do not help to develop the power of attacking and stating problems.

The next step will be to draw a line, say, 3″ long; extend it 2″, 1½″, and 2½″ successively. From the starting-point—that is, the beginning of the first line—draw another line, say 3½″ long at right angles, and complete the rectangles contained by this line, and the whole extended line and each of its parts. In other words, let the class construct the figure for *Euclid*, II. 1.

If the teacher has burnt his copy of Euclid's *Elements* (most of them are dry enough), one may possibly be found in the Free Library; and if not there, the best place to look would be the museum, department of antiquities, period 2000 B.C.

The attention of the class may now be drawn to the fact that the total area is found either by $3\frac{1}{2}(3 + 2 + 1\frac{1}{2} + 2\frac{1}{2}) = 3 \times 9$, or by $(3\frac{1}{2} \times 3) + (3\frac{1}{2} \times 2) + (3\frac{1}{2} \times 1\frac{1}{2}) + (3\frac{1}{2} \times 2\frac{1}{2})$. Now draw a similar long line $a + b + c + d$, and another x at right angles. Let the class complete the rectangles, and state the area of each. The analogy with the arithmetical process should be noted, and a few simple multiplications worked. As the square of a number has been dealt with in Section VI., this may occur in the examples; but the cube may as well be reserved until the geometrical illustration is reached in Section XIV.

An extension of the process may follow by constructing the square $(3'' + 2'') \times (3'' + 2'')$, and the rectangle $(4'' + 3'') \times (3'' + 2'')$, calculating the area, and then considering the products $(a + b)(a + b)$ and $(a + b)(b + c)$. In fact, these and what follows will, in the case of most classes, serve for the examples mentioned above.

Turning to the multiplication of negative quantities, the idea of a man walking east or west from a certain point may be considered again. If a man starting from this point walks five miles in a westerly direction, his position is five miles from the point. If now another man walks four times as far in the same direction, his position is $4 \times -5 = -25$. Similarly if a payment of £5 is referred to as £−5, a payment three times as great would be £−15. The class may then infer that a negative quantity multiplied by a positive quantity produces a negative quantity. If there is any suspicion in the minds of the class that the result would not be the same if the positive quantity were multiplied by a negative quantity, reference can be made to the area of a rectangle. Here it does not matter whether l be multiplied by b or b by l. The numerical result is the same, and the sign merely indicates the direction in which this result operates—east or west, credit or debit.

It is hardly worth while at this stage to attempt to establish the fact that a negative quantity multiplied by a negative quantity gives a positive quantity, and the class may accept the teacher's interpretation.

The class should next multiply out $(a + b)(a - b)$ and $(a - b)(a - b)$, and compare the results with a diagram in each case.

The products obtained up to this point should be factorised. A few more examples of the form $(px \pm qy)(mx \pm ny)$ may be given for practice; but unless the class exhibit a special interest, and time is not important, these should be limited.

The whole of this section takes almost as long to write out as it does to cover in class. With a fairly intelligent body of students a great deal of it would be done orally.

Exercises.

1. A rectangular field is a yards long and b yards wide. What is the area, and what is the distance round it? How long would it take a man to walk round it at the rate of x miles per hour?

2. Two towns, A and B, are x miles apart. C lies between them y miles from B. How far is A from C?

3. A room l feet long, b feet wide, and c feet high is to be papered from floor to ceiling with paper 21″ wide. How much will it take if the doors, windows, and fireplace have an area of 100 square feet? Find first a formula for the area of the walls.

4. What is the area of a square of which the side is x feet? If the sides are increased by 4 feet, what is the new area? If the original square is increased in one direction by 7 feet and decreased in a direction at right angles to this by 2 feet, what is the new area?

5. The area of a certain square is $p^2 + 2pq + q^2$. What is the length of one side?

6. The area of a rectangular field is $a^2 + 5a - 24$. What are the lengths of the sides?

7. Multiply out $(1 + x)(1 + y)$. Suppose x to be ·01 and y to be ·02, what terms in the product could you neglect if your result is only required to an accuracy of ·1 per cent.? Repeat the process with the product $(1 + x)(1 - y)$.

8. A piece of metal which should be exactly 10 cms. square is made ·1 cm. too large in one direction and ·2 cm. too small in a direction at right angles to this. What is the percentage error in the area?

9. A path a feet wide surrounds a plot of grass x feet long and y feet wide. Find a formula for the area of the path.

Section VIII.

This section will complete area by dealing with the circle. State the object of the lesson as the discovery of a method.

Let the class draw circles about three or four inches diameter—these drawings are frequently made far too small. Then let them draw the inscribed and circumscribed squares, and calculate the area of each. (Exercise on square root incidental to a new problem, and therefore not mere drudgery.) The area of the circle will obviously lie between the two.

Then let them draw the inscribed or circumscribed pentagons. In order to avoid confusion, these may be drawn on tracing-paper and "applied" to the circle. Follow this up by the hexagon and octagon.

Ask the students what happens as a figure with a greater number of sides is drawn. The reply required is, of course, that the inscribed or circumscribed figures approach the circle in area. Ask them what would be the result if it were possible to draw a polygon in a circle with an infinite number of sides.

Recall method of finding area of polygons by cutting up into triangles. Inquire whether it is possible to divide the circle into triangles. Why not? (One side would be curved.) Suppose, however, the triangles are very small; would the error of assuming that the curved side was straight be appreciable? Why? Try that method then.

Before permitting the class to cut up a circle into triangles in the usual way, ask them to find the length of the bases of half the triangles in terms of the circumference. Let them arrange the triangles to form the parallelogram, and infer that $A = \pi r^2$.

As the radius is rarely measured directly in practice, the class should substitute 3·1416 for π and $\frac{d}{2}$ for r, and obtain the formula $A = \cdot 7854d^2$.

The class may now draw circles of 1, 2, 3, 4 . . . inches or 2, 3, 4, 5 . . . centimetres radius, calculate the areas, and plot the curve between radius and area on squared paper. This curve may be compared with that obtained in Section V. between radius and circumference.

Ask the class to suggest a method of finding the area of a sector of a circle.

A very interesting model, consisting of a circular wooden disc divided into triangles is made by the pupils of the Stanley Trade School, West Norwood. The triangular pieces are glued to a flexible strap which passes round the two halves of the circumference of the disc, and the change from the circle to the equivalent parallelogram can be made in a few seconds.

EXERCISES.

1. A square field is 2 acres in extent. What is the largest circular running track that could be arranged if 10 yards are to be retained for spectators all round? Suppose the track is to be 6 yards wide, what will be its area? What is the difference per lap between the inside and the outside of the track?

2. A cast-iron pipe is 4″ outside diameter, and the metal is $\frac{1}{2}$″ thick; what is the area of the internal cross-section?

3. A hollow steel shaft is 12″ diameter outside and 8″ diameter inside; what is the area of cross-section of the metal?

4. Find the area of a sector of a circle 3″ diameter containing 45°.

5. A rocking lever—that is, a rod swinging about a point—moves backwards and forwards through an angle of 30°. The rod is 9″ long, and it is required to protect it for 7″ of its length by means of a tin casing 3″ deep. Sketch the shape of the box, giving approximately the dimensions, and find the area of the tinplate required.

6. Find the area of metal required for a shallow semicircular tin tray to hang against the wall. The radius is 3″ and the depth 1½″. The back, which rests against the wall, is a semicircle 6″ diameter.

7. Find the amount of metal required for similar box to that in Question 6 constructed so as to hang in a rectangular corner.

8. Draw a square-headed nut and bolt, making the side of the square head and nut 1½ times the diameter of the bolt + ¼″. Thickness of head and nut ⅔ diameter of the bolt.

9. Draw a hexagonal nut and bolt. The rule for the size of the head and nut is the same as in Question 8—namely, distance across the flats = 1½ diameter of bolt + ¼″. Put this rule into a formula. Another rule is, diameter of nut across the angles = 2 × diameter of the bolt. Which rule gives the bigger nut for a given diameter of bolt? Is the difference large enough to be of any importance?

The five following sections deal with the properties of triangles and simple trigonometry. Their inclusion at this stage makes the first year's work rather heavy, especially for a weak class. If it is thought desirable, they may be omitted from the first year's course and included in the second year's course in drawing, which, it should be noted, falls outside the scope of these articles. Sections IX., X., and XI. should certainly be taken somewhere in the preliminary technical course, but as to the inclusion of Sections XII. and XIII. there may be a difference of opinion. It has, however, been thought advisable to give all the sections at this stage in order to give completeness to the scheme.

Section IX.

Let the class draw a number of triangles, measure and tabulate the lengths of the sides and the magnitude of the angles.

Ask them to draw a triangle with sides, say, 2, 3, and 6 cms. long. Ask why they can't draw such a triangle. Suggest reference to the tabulated results, and ask for the inference.

Ask the class to find from the table whether there is any relation between the greatest angle and the longest side. Again referring to the table, ask the class in which triangle they have drawn the sum of the angles is greatest. It is extremely probable that the difficulty of drawing accurately and of using the protractor with skill will permit of this question being put. If so, the next questions will be, How accurately can you draw and measure angles with your protractor? Do you think that the differences in the sums of the angles are accounted for by errors of drawing and measurement? What, then, is the most probable value of the sum of the angles?

Then ask the class to state the three inferences for any triangle—namely (*a*) any two sides are greater than the third side; (*b*) the greatest angles subtended by the greatest side, and *vice versâ*; (*c*) the three angles of a triangle are together equal to 180°.

Let each student draw a triangle, and extend one side. Suppose ABC to be the triangle, with the side BC extended to D.

Ask for the number of degrees in the angle ACD + the angle ACB. Ask next for the number of degrees in the angle ABC + the angle BCA + the angle CAB (no protractor to be used). Then ask what relation the external angle bears to the two interior opposite angles.

A weak class may find this relation by using tracing paper. Let the class draw a semicircle, and find by trial what is the largest (or smallest) angle they can put in it. Then ask for the inference. Finally, let the students compare the angles at the centre and circumference of a circle on the same arc.

If Questions 16, 17, 18, Section V., have been done, the two foregoing paragraphs will be unnecessary. The same topics can, however, be attacked from a different point of view. Let each student stick two pins in his drawing paper two or three inches apart. Then, placing the set-square with the right angle between the pins, and with the sides of the set-square pressing firmly against the pins, let them mark the position of the angle. This should be repeated for a number of positions of the set-square, and the points joined up by a freehand curve. The questions may then be asked:—

Can any one recognise the curve? Can you give any reasons for believing that the curve is part of a

circle? Can you suggest a method of finding out whether the curve is part of a circle, and, if so, what part?

A similar process may then be followed with the other angles of the set-square, and the obvious conclusions drawn. In order to avoid connecting the last two truths too closely with the set-square, the students might carry out the experiment with triangular pieces of cardboard cut out by themselves. This, however, is only really necessary with a young class, and evening students cannot, as a rule, afford the time.

Problems similar to Exercise 6 may be devised by the teacher drawing lines between places on a map, giving the bearings to the class, and asking for the path to be traced and the angle summed.

EXERCISES.

1. Two angles of a triangle are 50° and 70°. What is the third angle?
2. A triangle has angles of 70°, 70°, and 40°. What do you know about the sides?
3. What are the number of degrees in an equilateral triangle?
4. The angle at the apex of an isosceles triangle is 70°. What are the angles at the base?
5. Find, without using your protractor, the angles between the sides of a regular pentagon, hexagon, heptagon, and octagon.
6. Starting at one corner, a man walks all round a triangular field. Through how many degrees has he turned? What would be the answer in the cases of fields having four and five sides? If a man walks all round a circular path to his starting-point, through what angle has he turned?
7. Construct an angle half the size of a given angle by two methods.

Notes for Teacher:—(*a*) Angles at centre P circumference of a circle; (*b*) ordinary method of bisection.

8. The exterior angle of a triangle is 75°, and one of the interior opposite angles is 45°. State the magnitude of the other two interior angles, and construct the triangle.
9. When a straight line falls on another straight line it makes two angles. If one of these is 30°, what is the other?
10. Draw two parallel straight lines, and another line across them, making an angle of 30° with one of them. Without using your protractor write down the number of degrees in the other angles, and notice which are equal. Which are interior angles, exterior angles, and opposite angles? Try to state what holds good in the case of these angles when a straight line cuts two or more parallel straight lines.
11. Define a square. You are given a piece of paper ruled in squares. How could you test whether the squares are equal? (Draw a diagonal.)
12. What is the sum of the interior angles in a quadrilateral figure?
13. One angle of a parallelogram is 60°. What are the other angles?
14. If one angle of a parallelogram is greater than another by 30°, what are the angles?
15. A quadrilateral figure has three of its angles 80°, 80°, and 120°. What is the fourth angle? Check your result by drawing and measuring.
16. A figure has angles of 45°, 60°, and 75°. Find the fourth angle, and check your result by construction. What is the figure?
17. A quadrilateral has three of its angles 30°, 45°, and 60°. Find the fourth angle, and check by construction.

Section X.

The object of this section is to inquire into the relation between the sides of similar triangles.

It should first be explained that similar triangles are those which have each of the angles of the one equal to those of the other. A number of similar triangles should be constructed by the students. One method is to extend two sides of a triangle and draw a line parallel to the third side. With a very weak class the triangles should be constructed separately, the smaller one "traced," applied to the other, and pricked off. The sides should then be measured and tabulated.

In order to render the relation plain to the class (who, it should be borne in mind, have no idea what to expect) one side may be extended to double its length, and from the end of this a parallel line drawn. Thus, if on the base BC a triangle ABC is constructed, BC may be extended to C^1, and from C^1 a line drawn parallel to AC to meet BA produced in A^1. On measuring up the lines BA, BA^1, the relation will at once be clear, and question as to whether this holds for all similar triangles may be put to the test.

The inference may now be expressed as the equality of two ratios. Thus, if a and b, c and d are the pairs of sides compared,

$$\frac{a}{b} = \frac{c}{d}.$$

To see whether the class have grasped the notion that both sides of an equation may be treated similarly, they may be asked, incidentally, whether in this case

$$\frac{b}{a} = \frac{d}{c}.$$

Any difficulty on this special point would be removed by referring again to the results of their measurements.

The relation between this "equality of ratios" and the "rule of three" may then be indicated.

The generalisations should then be applied to the construction of a plain scale, a diagonal scale, and the solution of problems in proportion graphically and arithmetically.

It is perhaps necessary to offer a word of warning as to examples of the latter type. They form the centre of stupidity in many books on arithmetic, and it is well worth trying even a good class with the question: If a fisherman catches one fish in five minutes, how many will he catch in an hour? If nobody catches a crab over this, they may be tried with the more subtle one: When it is two o'clock at Greenwich it is three o'clock at Berlin. What is the time in Berlin when it is six o'clock in London?

EXERCISES.

1. Divide a line 4″ long into seven equal parts. What is the actual length of each part?
2. A scale is to be made of 3″ to 1′; draw it to measure 2½′.
3. Construct a scale of 1½″ to 1′ to measure up to 4′.
4. A drawing of the playground is to be made on a piece of paper 32″ × 22″. Find what scale will be most suitable, and construct it.
5. The plan and elevation of a piece of machinery 4′ high on a base 10′ × 6′ has to be drawn on a piece of paper 22″ × 16″. Find what scale will be most suitable, and construct it.
6. Divide a line 4½″ long in the ratio 7 : 3.
7. Construct a diagonal scale to measure hundredths of an inch.
8. Construct a scale ½″ = 1′, showing the inches diagonally.
9. A map is drawn to a scale of 2″ to an inch. What will be the distance apart on the map of two towns which are actually ten miles apart?
10. On a plan drawn to a scale of 1½″ to 1′ is marked a length of 8′ 7″. What is the length on the plan, and what would it be if the scale was ½″ to 1′?
11. A vessel has completed 1,250 miles out of a journey of 1,762 miles at the average rate of 16 knots. A breakdown in the machinery occurs, so that the average rate of steaming for the rest of the journey is only 8 knots. How long will it take to complete the journey? How long will she be overdue?
12. The *Mauretania* is said to burn 1,320 tons of coal in 24 hours. How much will be burnt between Liverpool and New York if the passage takes 4 days 20 hours? If 1 ton of coal suffices for 50 horse-power for 24 hours, what is the horse-power of this vessel?
13. A train covers a certain journey in 6½ hours when travelling at the average rate of 40 miles per hour. What would be the time required if the average rate was 52 miles per hour?
14. A man's wages are 35s. for a 54-hour week. What will he receive if he has lost 5½ hours? What is his pay per hour?
15. The profits on a business for 25 weeks are £127, 15s. At what rate is the profit per annum?
16. A contractor who has undertaken to construct a light railway line for £6,000 finds that when he has completed ⅓ of

it he has spent £4,000. Assuming that the remainder of the line is no more costly, what gain per cent. will he make? Supposing that £3,000 has had to be borrowed from a bank at 4 per cent. after the first six months, and that it takes 12 months to construct, what is his profit?

17. If, when the average rate of wages is 7d. per hour, the cost of building a house is £675, find the cost when the average rate of wages is 6½d. per hour.

18. If a tap allows 7 gallons to pass in 2½ minutes, how long will it take to fill a tank holding 17 gallons? If a tap allows 6 gallons to pass in 2½ minutes, how long will it take to empty the same tank? How long will it take to fill the tank when both taps are open?

19. Solve Exercise 3, Section II., graphically.

20. What weight of tin must be added to 72 lbs. of lead in order to make an alloy containing three parts of lead to two parts of tin?

21. Gunpowder may consist of 15 parts nitre, 3 parts charcoal, and 2 parts sulphur. Find graphically the amount of each constituent in 1 cwt. of powder.

22. A bucket of water when full weighs 45 lbs., and when half full 25 lbs. What does it weigh when quarter full, and when empty?

Section XI.

The special properties of right-angled triangles should next be considered. The work of Section IX. may be recalled, and the students may *deduce* the fact that the acute angles are complementary.

The sides of a right-angled triangle should be measured, and it may be pointed out that the square on the side opposite to the right angle is equal to the sum of the squares on the other two sides in this particular case. The class may then be asked to find out whether this is an accident or a particular example of a general law. The inquiry may be made by measuring and squaring the lengths of the sides, and checked by drawing the squares cutting up and superposing.

Examples may now be worked on heights and distances, using the formula $h^2 = b^2 + p^2$.

Exercises.

1. A rectangular field is 240 yards long and 180 yards wide. What is the length of a path from corner to corner? How long will it take a man to walk half-way round the field, and the length of this path, at the rate of 4 miles per hour?

2. A ladder 20 feet long rests with its top against a wall and its foot 12 feet away. Find the vertical height to which the ladder reaches.

3. It is required to reach a point on a house 35 feet from the ground, and it is not possible to place the foot of a ladder more than 10 feet away. What should be the length of the ladder?

4. The radius of a circle is 12″, and the length of a chord is 9″. Find the shortest distance of the chord from the centre.

5. A gun has a range of 3 miles, and it is placed at a point 1½ miles distant from a straight road. What length of the road is covered by the gun?

6. The sides of an isosceles triangle are $12x$ feet, and the base is $8x$ feet. Find by calculation the length of the line from the apex to the middle point of the base.

7. A flagstaff has to be stayed by three wire ropes, which are attached to the staff at a point 20 feet from the ground. Two of them are to have their lower ends fastened to stakes fixed in the ground 10 feet and 15 feet from the foot of the staff. The third is to be fixed to a ring, 10 feet above the ground, in the wall of a house 25 feet away. Find the length of each rope, allowing 2 feet at each end for splicing.

8. You are given two squares containing 64 square inches and 81 square inches. Construct (*a*) a square equal to their sum; (*b*) a square equal to their difference.

9. A lean-to shed is 10′ wide, 10′ 6″ high at the back, and 6′ in front. What will be the approximate length of the rafters?

10. In the above question, suppose that the rafters were 11′ 6″ long, what would then be the height at the back if the other dimensions remained the same?

11. The depth of a span-roofed house front to back is 28 feet, and the height of the ridge is to be 14 feet above the eaves. What will be the approximate length of the rafters?

12. A train goes up an incline of 1 in 120 at the rate of 30 miles an hour. How far has it risen vertically at the end of two minutes?

13. You are given right-angled triangles having the sides containing the right angle 1 cm. and 1 cm., 1 cm. and 2 cms., 2 cms. and 2 cms., 2 cms. and 3 cms. The length of the hypothenuse in each case may be expressed shortly as $\sqrt{2}$, $\sqrt{5}$, $\sqrt{8}$, $\sqrt{13}$, measured in cms. If you understand this, can you draw lines of the following lengths: $\sqrt{10}$, $\sqrt{20}$, $\sqrt{29}$, $\sqrt{40}$, $\sqrt{24}$ cms.

14. (*a*) Draw a line $\sqrt{5}$ cms. long, and find how many such lines are equal to $\sqrt{20}$ cms. (*b*) Compare the lines $\sqrt{10}$ cms. and $\sqrt{40}$ cms. (*c*) What do you think is the length of half the line $\sqrt{24}$ cms. long?

Note.—Questions 13 and 14 are suggestive. More data would be required to establish the truth, and inaccuracies of drawing and measurement render some of the data unreliable. It is, however, put forward as an example of the way in which the teacher who wishes to deal with surds may proceed. If he is aiming at a good solid introduction to trigonometry, this is the time and place to deal with surds.

Section XII.

Draw a right-angled triangle on the blackboard, and ask what it is. Then ask further for each side to be named (perp., hyp., base).

Ask, in view of the last section but one, what they know of the ratio, say, of the perpendicular to the base. Does it, for example, depend on the length of each, provided the angles are kept constant. Hence get the class to state that the ratios of any two of these sides are constant for a given angle, and state the terms *sin.*, *cos.*, *tan.*

Set the class to find the ratios for angles of 0°, 30°, 45°, 60°, and 90°. Let them find the values for a few intermediate angles by drawing and measuring. Then introduce a table of natural sines, cosines, and tangents, and show how to use them.

Show that the length of the projection of a line of length l in any direction making an angle A with the original direction is $l \cos A$. Recall the method of finding the area of a polygon by cutting up into triangles and dealing with each separately. Work examples on the pentagon, hexagon, and some irregular polygons.

A simple form of theodolite, which may be home-made, should be used to show how angles of elevation and depression are obtained, and a simple plane table would also be useful.

Exercises.

1. Refer to Exercises 2 and 3, Section XI., and find the angle between the ladder and the ground and the ladder and the wall in each case.

2. Refer to Exercises 9, 10, and 11, Section XI., and find the angle of the roof with the horizontal in each case. What is the advantage of a steep roof? Is the span-roofed house too flat in your opinion?

3. A man walking along a straight road notices that at one milestone a church spire appears to be in a direction making 30° with the road. At the next milestone the direction appears to make an angle of 60° with the road. How far is the church from the road?

4. A man wishes to know the width of a river. Starting from a point opposite to a tree, he walks along the bank for 40 yards, and then finds that the direction of the tree makes an angle of 60° with his path. What is the breadth?

5. A man 6 feet high stands 5 feet from a lamp-post, and his shadow is 16 feet long. What is the height of the lamp?

6. At a point on the level, 150 feet from the base of a tower, the angle of elevation of the top is found to be 55°. What is the height of the tower?

7. The distance between two towns appears from the scale of the map to be 3 miles. The ground between them, however, is a slope, and when actually measured is 3·2 miles. What is the angle which the slope makes with the horizontal?

8. Find the area of (*a*) a pentagon, (*b*) a hexagon, inscribed in a circle 6″ diameter.

9. Find the area of a rhombus 3″ side containing an angle of 60°.

Note.—Questions such as No. 2 may be met with the criticism that neither teacher nor students know enough of practical details to supply the answer. It is the business of both to endeavour to acquire this knowledge, and the questions are intended to suggest some of the points to which attention might usefully be drawn.

Section XIII, to the Editor's great regret, is crowded out this month.

A CORRELATED SCHEME BASED UPON ÆSOP'S FABLES.

This Scheme is designed to cover a year's work in the upper classes of an Infants' School. Full Notes on the Scheme will appear each month until the whole plan has been worked out in detail.

Fable.	Colouring.	Object Lesson.	Modelling.	Brushwork.	Recitation.	Freearm Drawing.	Singing.
The Lark and Her Young Ones.	Sketch showing nest with young larks. Farmer and sons leaning over gate.	The Lark. Oats. Wheat. Bread.	Cottage Loaf. Nest with Eggs.	Ear of Wheat. Ear of Oats.	Two verses of Hogg's "Skylark." The Little Girl and the Skylark.	A Sickle. A Poppy.	The Farmer.
The Crow and the Pitcher.	Sketch showing crow dropping stones into a pitcher.	The Crow. Water. Clay. A Jug.	A Pitcher.	Tree in winter showing Crow's Nest. A Pitcher.	Two verses of "How the Water comes down at Lodore." The Crow and the Pitcher.	A Pitcher. A Cup and Saucer.	The Water Fairy.
The Cats and the Cheese.	Sketch showing the monkey weighing the cheese, cats watching.	Cheese. Monkey. Pair of Scales. Iron.	Scale Pan. Wedge of Cheese.	Milk Pan. Cheese with wedge cut out.	Two verses of "The Village Blacksmith." The Holiday.	Miner's Pick and Shovel.	Merry Milkmaids.
The Fox and the Goat.	Sketch showing fox in the well, goat looking over the edge.	Fox. Goat. Leather. A Well.	A Bucket. Goat's Horns.	Oak Leaf. Bucket and Chain.	Two verses from "The Well of St. Keyne." The Silly Goat.	An Axe. An Acorn.	The Hunt.
The Old Man and His Ass.	Sketch showing the man and his son carrying the ass over a bridge.	An Ass. Thistle. Rain. Carrots and Turnips.	A Carrot. A Turnip.	Water Scene showing Cliffs.	Two verses from "The Brook." The Cunning Donkey.	Head of Ass. Thistle.	Summer Shower.
The Lion and the Mouse.	Sketches showing— 1. Mouse begging for mercy. 2. Mouse gnawing net round lion.	Mouse. Lion. Flax. String. Cord. Rope.	A Mouse. A piece of Rope.	Flax Plant in Flower.	Verse from "The Glove and the Lion." A Field of Flax.	A Mouse.	Creep Mouse.
The Fox and the Crow.	Sketch showing crow on branch of tree, fox underneath.	A Window. Glass. Thrush. Nightingale.	Plum and Leaf.	Cherry and Leaf.	Four lines from "The Nightingale" (Scott). Cruelty.	Bird's Cage.	Sly Reynard.
The Town Mouse and the Country Mouse.	Sketch showing table with fruit, etc., mice running from cat.	A Farmyard. Peas. Apple. Sugar.	Pea Pod.	Harvest Flowers.	Four lines from "L'Allegro." Greedy Freddy.	Apple and Leaf.	Creep Mouse.
The Dog in the Manger.	Sketch showing dog barking at ox.	Dog. Hay. Cow. Articles made of horn and bone.	Cow's Hoof.	Ox-eye Daisy and Grasses.	Two verses from "Dog Tray." The Children in the Hayfield.	Dog's Head.	The Little Haymakers.
The Wind and the Sun.	Sketches showing— 1. The man wrapping his cloak tighter, and 2. Taking it off.	The Wind. The Work of the Sun. Shadows. Snow.	Basket of Grapes.	Plum and Leaves.	"The Wind in a Frolic." Sunshine.	Clothes Line with clothes blowing. Windmill.	Summer Breezes.

NATURE STUDY IN THE METROPOLIS.

Extracts from the L.C.C. Report.

IF Nature Study is to be successful and profitable, some outdoor work is absolutely essential, for in this way only can Nature Study be a real study of Nature. It is therefore pleasing to report that Nature walks are becoming more and more common, especially in schools within easy access of parks, commons, or open spaces, and that the classes which have come under observation in their walks have, on the whole, been very satisfactorily conducted. In some cases, however, they have been too large for the work to be thoroughly effective. The children make rough notes and sketches, which are elaborated in their Nature note-books in school, or they are called upon to express in their own words what they have seen and learnt in their walk.

Reduced tramway fares for classes of children in schools remote from parks and open spaces would give an additional impetus to this valuable and interesting work.

Nature excursions, too, are gradually becoming more common. During the year now under review classes of boys from Bellenden Road, Hague Street, and Maryon Park, and a class of girls from Maryon Park, have spent a week in the country with their teachers. Nature Study occupied a prominent part in the week's programme, but due attention was also given to local history, geography, and geology. Mr. Shipman, who visited the class from Maryon Park Boys' School at Dorking, reported as follows: "The excursion as a whole has had considerable educational value. The boys have had experience of the inexpensive pleasure of country rambles; they have taken a great interest in flowers and trees, and have shown genuine appreciation of the beauties of Nature; churches and other old buildings have doubtless done something to develop an appreciation of beauty in art, as well as of the interest of historical associations; the boys have learnt lessons of self-control and of consideration and respect for others, they behaved nicely to one another, and the relations between them and their teachers were admirable, comradeship being fostered without loss of respect and authority."

The school garden is a valuable aid to Nature Study: it brings the child into touch and sympathy with Nature, and affords a simple and definite field of observation; it provides first-hand illustrations for a wide variety of lessons—for example, the site and aspect of the garden; the soil and its improvement by spade work, draining, and manuring; the build of a plant; what plants are made of, how they are nourished, and their organs of nourishment; sap and its movements; conditions of healthy growth; flowering, fruiting, and seeding of plants; evergreen and deciduous trees and shrubs, etc. Unfortunately, however, not more than sixty elementary schools in London possess a garden. The number might be largely increased at a comparatively small cost, for in many cases the necessary land is already available. Two gardens deserve special notice—one at Eltham, and the other at Manor Lane.

The enterprising headmistress of the temporary infants' school at Manor Lane, Lee, has used about a quarter of an acre of the site of the permanent school for the purposes of a garden, where each child in the upper classes has a small plot of ground of its own. In these plots seeds and plants are planted by the small proprietors. In the months of spring, summer, and autumn half-hour weekly lessons are given to each class. Each morning (weather permitting) the classes take a five or ten minutes' walk with their teacher through the paths, noting the appearance of new plants and flowers, or changes in those previously observed. This is followed in school by a conversation lesson with the teacher on what has been noted.

The garden contains:—*Fruits* (pears, plums, apricots, apples, gooseberries, raspberries, strawberries, currants), *Vegetables* (potatoes, carrots, radishes, lettuce, scarlet runners, broad beans, peas, cabbage, etc.), a miniature wheat field, eight different kinds of trees grown from seeds planted by the children, and a good variety of flowers.

Most of our schools are now supplied with aquaria stocked with small fishes, newts, water plants, and snails, and the stages of development of the frog are watched with keen interest. Terraria are to be found only in a few schools.

Nature diaries in which are entered interesting natural phenomena, and charts showing barometric and thermometric changes, are now fairly common in the schools.

The school museums should be more extensively used for the preservation of suitable objects for nature lessons. It is to be hoped that the recommendations of the recent Conference on School Museums will bring about some improvement in this direction.

The Botany Scheme is altogether inadequate to meet the needs of the schools. In the proposed reorganisation of the scheme preferential treatment should be given to the schools situated in congested areas, remote from parks and open spaces.

The correlation of Nature Study with the other subjects of instruction, especially drawing and modelling, so systematically recognised in infants' schools, is not so well carried out in the senior departments. Teachers are still to be found who place a drawing of a plant or a flower on the blackboard, to be copied by the children, instead of allowing them to draw from the object itself, thus reducing the educational value of the exercise to a minimum.

Nature Study should be, and is in many schools, the chief means of language training. It has already been shown how the subject may be used in teaching composition, both oral and written. It is also an important aid to the teaching of literature. The works of our greatest writers, whether of prose or verse, are full of references to natural scenery, so "the child naturalist is the soonest ready for the nature poets." Nature Study, too, affords the best preparation for specific courses of instruction in science.

A CHILDREN'S CALENDAR.

TEACHERS in infants' schools will derive much practical help from a new publication issued by Messrs. Philip, entitled *The Children's Calendar of Song, Game, and Verse*, compiled by our esteemed contributor, Miss Mabel A. Brown. The book follows the months in rotation, and gives for each appropriate rhymes, songs, and sketches of lessons suitable for the time of year. The material is of a high-class character, and infants trained on these lines will be well fitted to follow the best modern curriculum in the upper school. We like Miss Brown's practical suggestions very much, and our readers will find her careful references to books for teachers' use of special value. The book is fully illustrated in such a manner that the pictures also afford real help to the working teacher.

NATURE STUDY.

SOME CRITICISMS AND A WARNING.

BY W. FRANCIS RANKINE, HEADMASTER, CHURT ST. JOHN'S SCHOOL, SURREY.

[Our contributor, of course, voices his own opinions. The preceding article shows what can be done in city schools.—ED.]

THERE are many intelligent teachers to-day who are becoming rather wary of the newer Nature movement, and there is little wonder that such is the case. It is some nine years ago that the Nature-teaching germ crept somehow or other into the Code, and there is little doubt that this germ was of Transatlantic origin. In words it was expressed as a "knowledge of the common phenomena of the world," and from this phrase has originated what we now call Nature Study. But how far has the spirit of the phrase been preserved? Perhaps a too keen investigation would reveal the most unwelcome facts, and we might come to the conclusion that the Nature movement has not been too genuinely dealt with.

Even to-day the term Nature Study is made to represent much that is vague, useless, and spurious, and in fact no subject that has ever found a niche in our national curricula has been so variously rendered by its numerous exponents. Perhaps in matters educational we are more susceptible to faddism than in any other social department, and here is to be found the reason why the counterfeit has so often been accepted for the real thing. Yet really there is no defence for such a state of affairs, except, perhaps, that those who have courted ridicule in extravagant enthusiasm might introspectively discover the cause in their own misconception of matters in general. For without doubt true Nature teaching is founded on unassailable educational bases; it is not a superficial phase of things, nor is it concerned with a sentimental juggling with natural phenomena. It is a method of education that derives its full educational benefits from the direct observation and consequent reasoning relative to the obvious, evenly balanced vista of natural material that surrounds the educable unit. In fact, it is the widest science of the sciences; it is a method of attack—a point of view—and not, as is sometimes asserted by the extremist, a new subject to be crowded into the already congested programme of the elementary school.

A more broadened conception of the scope and aim of Nature teaching must necessarily follow from a careful analysis of its correct methods; but unfortunately this is too rarely attempted. We are too ready to become enamoured with new phases of thought, and often in extravagance of ideas and misconception of things in general we are lost in the labyrinth of side issues. This is exceptionally true of Nature teaching, and many have been guilty of translating its methods in various ways quite distinct from the true policy of the subject. This is not to be wondered at in the least, for in Nature we meet with many various phases, and the outlook is governed and controlled by personal experience, temperament, and character to such an extent that no two persons translate the outlook identically.

The beauty of landscape appeals to one, and the utilitarian aspect of wild life to another. The entomologist is solely concerned with the insect wealth of the countryside, and the botanical man thinks only of the plant life that abounds. And so on through the various aspects of the natural world. There are some who regard alone the æsthetic, and many who only regard the practical. Thus the æsthetic is merged with, or separated from, the practical, and in this way the Nature schemes of our schools hover between the ultra-æsthetic and the ultra-practical; and in passing we may state that these poles of thought are not good.

Too frequently we read on the first page of the Nature scheme the avowed aim, "To foster in the child a love of the beautiful." Now, a love of the beautiful is a welcome adjunct to the equipment of the child, yet there is a serious wastage of educational effort if teaching accomplish nothing more. Further, the avowed aim reads smoothly and comforting, and we have often seen it in the typed schemes that grace exhibitions. Yet things æsthetic are quite incidental to Nature teaching, and not ultimate; æstheticism calls for little mental effort, and develops but few faculties. We must, perforce, pass from it to the more valuable process of reasoning, and in this we have the keystone of the subject. The beautiful may command observation, yet the arrangement and subsequent classification of the material observed demands reasoning. Thus Nature Study is a great science conducted in the greatest laboratory; it is the science that takes us inexpensively to the far-reaching range of phenomena that constitutes our environment; it makes us keener students of those sociological environments that, artificial as they must be, are closely connected with the physical laws of Nature. And in the child experience it demands expression governed and controlled by educational means.

Fetish in Nature work has not been unknown, and in most instances has served to bring the subject into disrepute and ridicule. This is mainly traceable to a narrow conception of what Nature really denotes, and, fortunately, owing to educational administration, such abortive methods are quickly disappearing. For instance, it is curious to note how frequently flower study and even botany are offered as substitutes for Nature Study; in other cases entomology is called upon to do duty, and sometimes the dry bones of anatomical biology are called upon to pass for Nature teaching. This misconception is probably due to a gross misunderstanding of the scope of the subject, and apparently it has led its perpetrators to assume that Nature Study is natural history in disguise. A greater fallacy never existed. Thus, for instance, what does it matter to the Nature teacher if his class is perfectly innocent of the anatomical structure of the hedgehog, so long as they are acquainted with its habits through actual observation? Or what does it matter if his scholars are ignorant of the natural orders of plants, so long as they learn for themselves by observation how they grow, where they grow, and their various uses? This is the educational side of Nature teaching, and this is all that is required, and the teacher who has taken this view is on the way to successful work.

Again, there are some who have interpreted Nature teaching as a phase of science work, and with these one can show but little patience. It has led to the rise of a school of ultra-scientific faddists, who undoubtedly are a menace to true Nature teaching. In exerting the power which his unquestioned knowledge gives him, he has worked more harm to the cause of Nature Study than the genial, ignorant faddist who attempts to follow him. The ultra-scientific Nature teacher brings us into contact with that most pernicious form of so-called Nature teaching which derives its material solely from books, and of this no denunciation is too severe. It is largely to be found in great cities, where all Nature

teaching must necessarily be more or less artificial. There is no real Nature in cities, and the expression which follows its so-called Nature lessons is largely founded on second-hand knowledge. Primary experience is the *sine qud non* of Nature teaching. It is the true factor of success. Secondary observation as derived from photographs and pictures—*good* pictures—is permissible, but the material based on the written records of others is inadmissible. It is misleading, and robs the work of life. There is little excuse for such procedure, since there are few schools that are not in touch with natural phenomena, and, to speak candidly, those which are not should omit Nature teaching from their curricula. Real Nature teaching—that is, live teaching anent the luxuriant environment that Nature gives us in the country—is only possible where Nature has been liberal, where she has placed her woodlands and strewed her floral tributes on our landscapes. Thus it is that the real force of Nature teaching is confined to truly rural schools.

MODERN SCIENCE NOTES.

BY J. G. M'INTOSH, B.SC., SECONDARY SCHOOL, GATESHEAD.

A New Piece of Apparatus for Demonstrating Reflection and Refraction.

MOST teachers have felt the need in the laboratory for a piece of simple apparatus by means of which the student can utilise actual beams of light. At present the elementary facts on the propagation of light are generally illustrated by pin experiments. It is open to severe question whether the junior student really understands exactly what is being done when

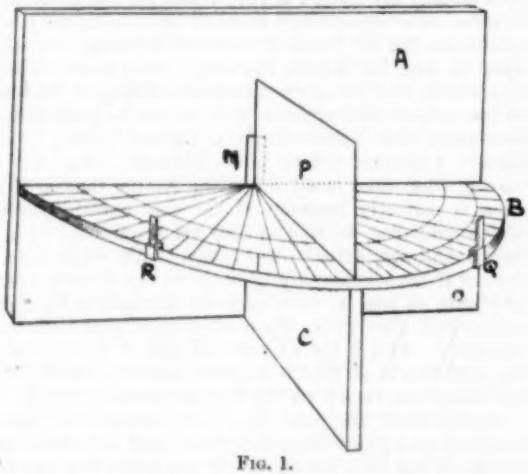


Fig. 1.

he works with pins. With a view to the demonstration of the more elementary facts I have devised the following pieces of apparatus, and after some years' experience I find that the usual difficulties associated with the pin experiments disappear. My object was to provide a simple piece of apparatus which could easily be made in the workshop at little cost, and which would also enable the student to trace the path of an actual beam of light in a moderately darkened room. As sources of light the incandescent burner acts very well, and with reasonable care the cost of renewal of mantles is small. Fig. 1 represents a perspective view of the apparatus used for showing reflection from a plane mirror. Figs. 2 and 3 show the plan and side elevation respectively.

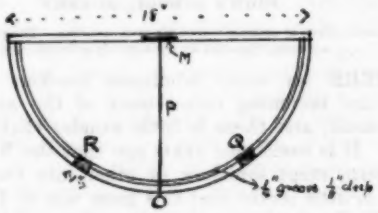


Fig. 2.

A, the back of the apparatus, is a piece of $\frac{1}{2}$" canary wood, 18" long and 12" high. B is a semicircular board of the same material and thickness of 9" radius supported on C. A piece of mirror glass, M, about $\frac{3}{32}$" thick and silvered on the *back*, is let into A flush with it. A is painted dead black and B dead white. The

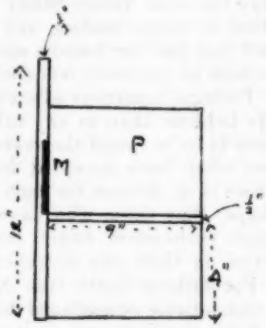


Fig. 3.

surface of B is then divided as a protractor from 0° to 90° on either side reckoning from O. A tin diaphragm, P, also painted dead black, is fixed into a small slot cut into B, and brought up flush with the *front* of the mirror M. R and Q slide in an $\frac{1}{8}$" slot, and are made of $\frac{1}{8}$" brass. To R is fixed a piece of thin brass or tin with a narrow slit, while Q carries a piece of ground glass. The screen in an ordinary camera answers very well. In the sketch R and Q should be shown a little larger. A beam of light is passed through the slit R, and arranged to fall at the junction of the mirror and

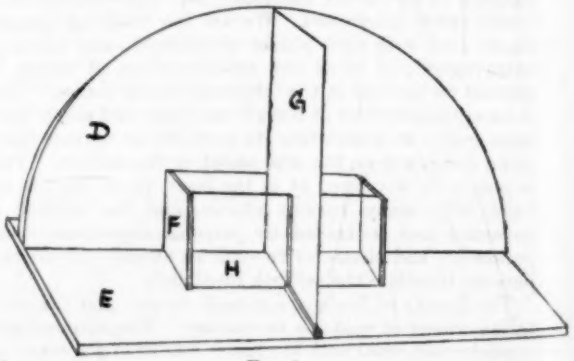


Fig. 4.

P. The thickness of the mirror is sufficient to act as a slit, and the reflected beam is caught on Q. The angles

of incidence and reflection can be directly measured. The intersection of the plane of the beam with B can be looked upon as a ray of light. The apparatus possesses the following advantages. It is easily made, cheap, and efficient. The student works with actual beams of light, and not imaginary lines. With the

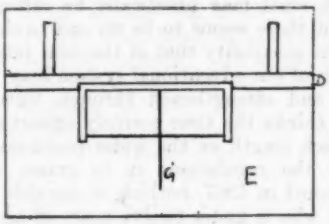


Fig. 5.

light from an incandescent burner good results are obtained. For demonstration purposes I have a larger model for use with the lantern.

Figs. 4, 5, 6, and 7 show also the same idea utilised for refraction experiments. The base E and back D are the same dimensions as before. E is painted dead black and D dead white. F is a small box, well made, with a glass front, which is made water-tight. I used

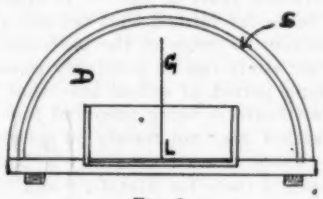


Fig. 6.

white lead, and found it answer well. The back of the box is painted dead white and let into D, so that it is flush with it, as shown in Figs. 5 and 7. A piece of mirror glass is fastened to the bottom, H, of the box, and a diaphragm of blackened tin fixed as in the sketch, resting on the mirror. The thickness of the mirror again acts as a slit. The slot S may be used to carry a similar arrangement to R in Fig. 1. The box is

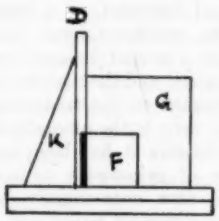


Fig. 7.

filled with any liquid whose index of refraction is required, and a beam of light arranged so that after refraction it impinges at L. It is then reflected upwards through the liquid and emerges. The course of the beam can be vividly traced on the back, D, and the angles measured with an ordinary protractor, while the general phenomena of refraction are also clearly shown.

In our own apparatus the box F can be removed easily and other liquids substituted readily.

The Colouring of Plants.

In his latest book* on the biology of chlorophyll Professor Stahl makes some interesting speculations on the cause of the prevailing green colour of plants and vegetation. The observations of Engelmann on the colour of the algal vegetation of the sea, and of Gaidukov on the Cyanophyceæ, show that the colours are largely complementary to the light which falls upon them, and in Professor Stahl's opinion the same theory may be applied to terrestrial vegetation. The spectrum of chlorophyll may be regarded as made up of two absorption spectra, the absorption at the blue end agreeing very closely with that of the colouring matter of yellow leaves; while that at the red end agrees with that of the green colouring matter formed when etiolated plants are exposed to light, gradually disappearing when the autumnal tints prevail. On this hypothesis, therefore, the colour of the leaf may adapt itself to the general conditions of the diffused light incident upon it, the yellow being the complementary blue of the sky, and the green due to the orange and red of sunrise and sunset.

On the matter of energy assimilation Professor Stahl points out that the region of least absorption corresponds with that of maximum energy, so that the plant does not depend for its assimilative work upon the rays of greatest energy. He shows that the non-absorption of green rays is not only due to the fact that chlorophyll makes no use of the rays which reach it in a weakened form, but that the absorption of these rays in direct sunlight is dangerous to the plant from their great heating power. Under ordinary conditions the energy used up by the chlorophyll in carbohydrate assimilation is only a small fraction of the total absorption. As the intensity of light diminishes, the amount of energy absorbed becomes more nearly proportional to the assimilating factor, and hence the adaptation to a complementary colour more feasible.

The destruction of chlorophyll by too intense illumination has generally been explained as due to chemical action. Professor Stahl, however, considers that the effects of heat rays are a great factor, and that variation in colour between leaves in the sun and in the shade is due to overheating. He also suggests that the yellow coloration of leaves in autumn is due to economical reasons. Yellow colouring matters contain only carbon, hydrogen, and oxygen, so that by keeping back green chlorophyll in the spring and re-absorbing it in autumn an economy is effected in nitrogen and magnesium, the remaining constituents of green chlorophyll, which must be of great value to the plant.

Deep Sea Sounding.

A new method on an electrical basis is being used in Germany for sea sounding. The great disadvantage of the present methods lies in the fact that the apparatus has to be brought to the surface after each measurement. One of the present methods consists of a glass tube silvered inside and closed at the upper part. This is attached vertically to a heavy lead. When the apparatus is lowered the water penetrates into the interior, compresses the enclosed air, and dissolves the silvering of the tube. The length dissolved gives a measure of the depth. The disadvantage consists in the renewal of the silver after each immersion. In the latest device

* *Zur Biologie des Chlorophylls, Laubfarbe und Himmelslicht, Verfärbung und Etoilement.* By Ernst Stahl.

the tube is connected to a cylindrical portion containing mercury. With increase in depth the corresponding increase in the pressure of the enclosed air causes the mercury to rise and make a short circuit with a pair of high resistance wires in the tube. The decrease in the resistance is measured on a Wheatstone bridge, which is calibrated directly in depths. Corrections are also made for variations in barometric pressure and the variable density of sea water.

Hysteresis Tests.

In a previous number of the *Practical Teacher* I called attention to the valuable method originated by Dr. Beattie of the Manchester University, by means of which a bundle of short strips in the form of a straight solenoid could be used instead of the conventional iron ring so inconvenient in general practice. The obvious disadvantage of the method lies in the errors which may be introduced owing to the strong demagnetising action which causes the BH loop to be narrow. Dr. Beattie and Mr. Elton in the *Electrician* during the month of June have made the valuable suggestion that a differential method may be employed. The differences between two B ordinates for a given H value are determined by a ballistic galvanometer and a special kind of key. The method has the advantage that the graphs of δB and H for short strips are nearly parabolic, so that two values of δB give the desired area with sufficient accuracy. The method has aroused much interest, as shown by the correspondence columns of the *Electrician*, and readers are referred to the June issues for full descriptions of the experiments. Two curious facts have been observed. The hysteresis loss of rings by the "step-by-step" method and the "differential" method agreed. When the samples were tested in short bundles of strips the results by both methods again agreed, but in this case the loss was consistently less than in the rings. A large series of experiments give a ring loss 1·65 times that of a short bundle. Again, an alternating current of frequency 100 gave the same loss both for strips and rings.

This and other interesting points are subjects for further investigation.

EDITORIAL NOTES.

The Practical Teacher is honoured incidentally in the distinction conferred upon the secretary of the National Union, and his wife, and hastens to wish Sir James and Lady Yoxall long life and health to enjoy the reward of ungrudging social service. The new knight has been for a long time one of our most valued contributors, and in spite of his editorial duties on the *Schoolmaster*, the editor hopes to induce him to instruct and inspire us in the future.

To yet another of our contributors our congratulations are heartily extended. Mr. W. E. Sparkes has recently been promoted to a district inspectorship under the London County Council, and we venture to congratulate the teachers and scholars who will be for the future in his care. To many of us one of the most enjoyable portions of the *Practical Teacher* is Mr. Sparkes's monthly paper on art matters, and one of the best he has ever written is to be found on page 73 of the present number.

Will our kind critics turn up page 5 of the July number and insert a comma after the word "qualm," in the third paragraph, and a full stop after "other." Our contributor's meaning will then be as plain as typography can make it.

SECONDARY EDUCATION IN SCOTLAND.

BY R. G. DICKSON, M.A.

THE fourth annual report on secondary education in Scotland, for which Dr. Struthers is responsible, deals with what may practically be called a transition year. But there seems to be no end to changes, and in view of the possibility that in the near future the whole framework of our educational system may be materially modified and strengthened through legislative enactment, he thinks the time scarcely opportune for dwelling at much length on the wider problems of organisation. By the regulations as to grants to secondary schools issued in 1907, nothing is payable in respect of any pupil who is under twelve years of age, or who has not satisfactorily completed what may be described as the elementary stage of his education. Once those requirements are met, every pupil becomes eligible for grant, provided that he is pursuing an intermediate curriculum in which all the main branches of a liberal education are fairly represented, and which has a normal duration of three years, with the Intermediate Certificate as its natural goal.

Specialisation.

By the time that certificate has been obtained—say, fifteen or sixteen years of age—it is expected that the mind will be so far formed that teacher and pupil will be in a position to judge of the particular direction in which further study can be profitably pursued. During the remaining period of school life—that is, while the Leaving Certificate is being prepared for—some degree of specialisation may not merely be permitted, but encouraged. There is no reason why a boy or girl who has developed a taste for literature and history, or for languages, or for mathematics and science, should not have a certain degree of freedom to cultivate his or her particular talent, treating the other school subjects as more or less subsidiary.

Curricula.

During the past year, as was to be expected, a somewhat difficult and delicate duty has been imposed upon the Department—namely, the approval of the intermediate and post-intermediate curricula submitted to it. The Department has set before it as its aim the securing, first and foremost, of a reasonable amount of attention to the mother-tongue, and thereafter the making sure that a proper balance was being observed between the linguistic and the realistic sides of intellectual discipline. In regard to the treatment of the majority of the subjects, very little amendment has had to be suggested. Sometimes it has been necessary to urge a greater measure of generosity towards English. The Department has also occasionally been compelled to take the extreme course of fixing a minimum amount of instruction in science and drawing, and of intimating that any intermediate curriculum where the time allowed for these two combined fell below an average of one hour a day during each of the three years could not be approved.

Science and Drawing.

Dr. Struthers is very pleased to be able to record that not a few of those who had serious misgivings as to the wisdom of introducing science and drawing into the normal curriculum have been convinced by experience of the value of such teaching, and have frankly borne

testimony to the beneficial effect which it is calculated to have on the mental development of the pupil. This policy has had the effect of bringing to the surface a group of difficulties with regard to the teaching of languages. Dr. Struthers, however, thinks that these would inevitably have emerged sooner or later. He points out that the arrangements governing language study in Scottish schools rest upon a basis that is not sufficiently well considered to be secure. They are largely the result of accident. He enters into the history of the last thirty years or so, and concludes by saying that language has been added to language without adequate reflection on what was involved, and without regard to the corresponding rise in the standard of mathematical teaching. Even before the advent of the regulations as to grants, with their plea for a single hour a day for science and drawing, the struggle had grown too severe. The position to-day is such that it behoves all who have the interests of language study at heart to examine the whole situation carefully, with a view to discovering where the most satisfactory remedy lies.

Language Study.

He suggests three ways in which this difficulty may be overcome. In the first place, the teachers concerned should scrutinise their own methods of instruction with unsparing vigilance, to see that there is no waste of energy, no time misspent in acquiring useless knowledge. In the second place, those who are responsible for the framing of curricula should strive to attain a clear understanding as to what the ends of language study are, and as to how these ends can be most surely and economically attained. He is of opinion that too many are still under the obsession that a smattering of two or three languages has more educational value than a sound knowledge of one. They do not realise that by limitation and concentration at the outset they may hope to render the single language chosen something like a real possession to the ordinary boy or girl, and may at the same time make certain, in the case of the brighter pupils, of laying a deep and sure foundation on which a knowledge of other tongues can be more rapidly built up. Lastly, the claims of the various languages upon the attention of different groups of pupils require to be weighed with full deliberation, and measures taken accordingly. There is a danger that, if matters are allowed to drift, the field of selection may ere long be unduly restricted. Greek is already being gradually ousted. Dr. Struthers thinks that to begin with there should be time within the limits of the intermediate curriculum to acquire a really good elementary knowledge of one language, and also, under ordinary circumstances, to break ground in a second. There is absolute freedom of choice as to what language or languages are to be taken up at this stage.

Change of Date of Examinations.

It was anticipated that the change of date from June to April would have a considerable effect on the character of the written work, but the report points out that, so far as can be judged, this change, which carries with it obvious advantages, has not been attended with any of the drawbacks expected. The Department made full allowance for the innovation when the papers were being set, and they were prepared to make full allowance for it also in the marking. But, as a matter of fact, it was surprising to find how slight a readjustment of the standard was required to adapt it to the new conditions. Whether the group certificate or the single subjects be taken as a test, Dr. Struthers says there is not a single case in which the percentage of passes is not at least equal to the average of the last few years. In the great majority of instances there is actually a more or less considerable advance upon the session immediately preceding. This result, he thinks, speaks well for the schools, and indicates that the examiners have been able to devise papers which do not lend themselves to "cram," and in which sound work throughout the course enjoys the preponderating weight that it deserves.

Confidence in Teachers.

During the last few years the Department has given the teachers the opportunity of the assessing of the marks of their pupils. The experiment has been highly successful, and the Department makes a warm acknowledgment of the debt due to the teachers for the care they have exercised in this matter. There were still, Dr. Struthers says, a considerable number of lists where the estimates given were much too generous, and there were others which were erratic or which betrayed an evident reluctance to discriminate. But, on the whole, there was clear proof that the sense of responsibility in this important matter is steadily growing. In particular, the general opinion given by the headmasters was often exceedingly helpful, and there were not a few schedules where the Department would have been justified in accepting it *simpliciter*, and where its task was merely one of verification.

Subjects of Instruction.

Almost all the inspectors agree that there is proof of a steady advance in English. Emphatic testimony is borne from more than one reliable source as to the prevalence of better methods of instruction in composition—excellence in which art is, of all the fruits of good teaching, at once the most uncommon, the most valuable, and the most difficult of attainment. Irrelevance is still common among the younger children, though in the higher-grade papers it is much less prevalent. The examiners all report that it seems to be almost impossible to eradicate the ill-omened associations that cluster round the old-fashioned paraphrasing exercise. History teaching shows a real advance, and the Department takes credit to itself that the publication of the Departmental memorandum on history was distinctly useful in helping to stir the waters and direct the attention of the teachers to the possibility of improvement in methods. In geography there are unmistakable signs of an awakening interest in methods. Much sound work is being done in classics. The report says, however, that it is to be feared that many teachers of ancient languages have as yet failed to appreciate the great advance that has taken place in the handling of other subjects, and the consequent necessity laid upon themselves of putting more thought into the question of method if classics is to maintain the position it has held so long, and held so deservedly, as one of the finest instruments of a liberal education. The reports received from the visiting inspectors are unanimous in their testimony to the sure, if gradual, progress that is being made in French. German, on the other hand, is undoubtedly under an eclipse. The reasons may be summed up briefly—(1) Fewer qualified teachers, (2) greater initial difficulties, (3) inertia of tradition, and (4) the sway wielded by the university regulations.

Mathematical subjects are handled in the schools with general efficiency. Drawing and science show a slow but perceptible rise in the standard of work. Interest in commercial subjects, on the other hand, flickers but feebly.

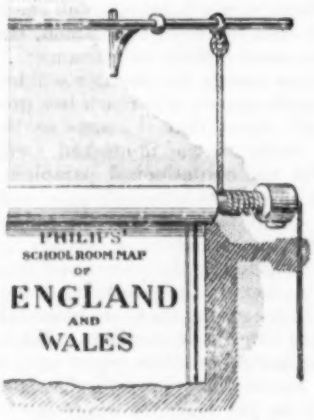
STATISTICS.

The report shows that the number of secondary and preparatory schools inspected during the past year was 108, and the number of higher grade schools 171, as against 155 last year. Under the Minute of April 27, 1899, £39,500 was allocated to 55 of these schools; while grants from committees of burghs and counties under Section 2 (1) (*b*) of Education and Local Taxation Account (Scotland) Act, 1892, amounted to £23,525, 11s. 5d., and grants from Scotch Education Department for science and art reached £17,665, 2s. 10d. The payments made out of the rates for the support of secondary schools under the management of School Boards amounts to £30,708, 11s. 9d. On the rolls there was a grand total of 18,316, whilst the average attendance was 16,928. The percentage this year was 92·4, against 93·7 last year. Of the 18,316 on the rolls, 9,671 were over fourteen years of age.

A TEACHER'S AID.

MESSRS. PHILIP AND SON have recently tackled the problem of map-mounting, with the result that they have been able to place upon the market a self-rolling and raising system which may be applied to maps of all kinds and sizes. We have taken the opportunity of inspecting the apparatus, which possesses the necessary qualities of simplicity and strength.

No special backboard or attachment is needed to support the maps, which are suspended by means of blind-cord from a picture-rail or bracket, or from ordinary nails driven into the wall. If no wall space is available, the maps may be suspended from the ceiling, or from the arms of a map stand. One set of cords can



be used for any number of maps of the same length, one map being removed and another attached in its place almost instantaneously. The level at which the maps are fastened to the cords can easily be reached by any one standing on the floor. The act of unrolling a map at the same time raises it to such a height that it can be conveniently consulted for reference or displayed to a class. We strongly advise all our readers to take the first opportunity of becoming acquainted with this new device, which will have the effect of smoothing the path of many a worried teacher.

The same firm send us a British Empire globe, excellently built and clearly marked, with particular attention to the territories over which flies the Union Jack. If we were fully alive to our imperial responsibilities, we should provide one of these globes for at least each two pupils in our upper standards.

TEACHERS AS ACTORS: A SKETCH.

THE September sun shed its benignant light once more over the sombre green of the pine-covered landscape, after weeks of rain and biting wind, as, with a single congenial companion, I set out from Weimar for a wooded hill-top about five miles away, where on that day were to be enacted brave "deeds of derring-do"—in other words, the pupils of the Grand Ducal Teachers' Seminary in Weimar had announced their intention of performing in the open air certain scenes from Goethe's *Goetz von Berlichingen*, the knight with the iron hand, and they had invited friends and relatives to see them tread the "buskined stage," or, to speak more accurately, the green sward. For two or three hours before the performance began the road leading from Weimar to the Rosenberg—the scene of the play—was black with people—fathers and mothers, uncles and aunts, nephews and nieces—all laughing and chattering with the gay irresponsibility of children, cheered on their way by the welcome and long-absent sunshine.

Arrived at our destination, a small plateau overlooking one of the most beautiful prospects in beautiful Thuringia, we found everything ready for the play. Stage properties there were of the simplest sort: a tower had been built of wood and covered with realistically painted canvas; while a table standing before a hut which happened to be there served at need for the bench in front of an inn, for a court of justice, and as indicating a room in Goetz von Berlichingen's castle. But the costumes were both adequate and accurate, and the background of green mountain land and dark brooding valley had been painted by Nature herself with lavish hand.

At the beginning of the performance the sun shone bright upon the mail coats of armed men and the picturesque rags of the peasantry, and as he sank slowly behind the distant heights of the Thuringian forest, and the mist rose ghost-like in the valleys, the red glow deepened, keeping time with the doom gradually but surely closing in upon the brave old warrior. As Goetz died night had set in, marking fittingly enough the close of a life filled with daring deeds honourably performed—the life of a simple soldier who moved without guile to a tragic end, in a world too complex and treacherous for a man of his simple faith.

The performance was introduced by a short prologue written by the classroom poet, and finely spoken by another student, whose voice and elocution would not have been out of place in a first-class theatre. The prologue itself gave evidence of a play of fancy and even imagination which promised still better things to come. The guests are welcomed in courteous terms, and then the poet speaks of the "height of his great argument," of the peasant war which desolated the land, and of Goetz himself, who, since Goethe took him for his theme, has in some sort become a national hero, speaking to the heart and conscience of a great people with trumpet tongue. Finally, the poet deprecates criticism, for "we are none of us great artists."

The play itself is carried through with the tremendous vigour of youth, restrained, however, by careful teaching. The actors are, in the nature of things, unequal to the highest flights of histrionic art; but they all speak with force, with feeling, and with a commendable absence of "amateurishness." What struck me

more than anything else, however, was the "sense for language" evidenced. There was a manifest appreciation of the æsthetic value of dignified words in alliance with worthy thought, and at the same time a marked absence of the "ranting" so dear to the youthful heart. But it must be remembered in this connection that the literature master, whose unsparing efforts had alone made the performance possible, is a poet and playwright of well-deserved reputation, an advantage for the future schoolmasters as unusual as it is enviable. If only Mr. William Watson would take charge of the literature class at one of our training colleges!

At intervals, too, there came the sound of music, fitting folk-songs rising fresh and clear among the trees—songs full of that sentiment which lies at the very root of the Teutonic nature. Nor was a touch of humour lacking: the beadle was there to demand silence in a ridiculously impressive manner, to call for applause at the end of each act, and to announce the interval for refreshments.

The whole performance was marked by a fine seriousness and an absence of self-consciousness, which, were there nothing else to recommend it, would already be a sufficient justification for the work and expense entailed. The German knows the value of simple pleasures, and he has not yet lost the faculty of reverence for the ideal; his nation's works of art are for him a living force, not a dead capital, to be drawn upon now and then by people of the cultured class. I have known of more than one old peasant woman who will sit over her sewing murmuring to herself certain of the better-known ballads of Goethe and Schiller; and only the other day, as I passed down the street, I came upon a youngster spinning his top and singing—very much out of tune, but with profound earnestness—Uhland's fine old song, "Ich hatt' einen Kameraden." We can scarcely imagine an English laundress reciting the "Ballad of Chevy Chase" over the wash-tub; if we could, we should have some idea of the passionate love of Germans of all classes for the riches of their own language.

Observation points to the conclusion that two factors are lacking in England whose influence is potent in Germany: one is enthusiasm on the part of teachers for literature and art, and the other is a theatre whose main purpose is educational. It is in no sense disloyalty to my own professional brethren in England that makes me deplore the apathy with which, but for certain outstanding exceptions, they regard their own literature. There are, of course, reasons for this state of affairs for which they are by no means to be held responsible—to wit, Government regulations, which insist upon "snippets" of subjects being taught which have no organic relation with living knowledge. William James says: "Most thinkers have a faith that at bottom there is but one science of all things, and that until all is known no one thing can be completely known." But educational authorities seem to have come to the utterly unphilosophical conclusion that because there is one science of all things, there also exist children capable of learning everything, and teachers able to guide them to omniscience! The man or the committee of men whose duty it is to draw up a syllabus of study should remember that there are certain bodies of knowledge which are more important than others, because of their bearing upon mental in contradistinction to physical well-being. With all respect, it seems to me far more important to know what Shakespeare thought of life than what Professor So-and-So thinks of this or that system of drainage—unless, indeed, one intends to adopt the profession of sanitary inspector. There are certain branches of study which help to keep our national consciousness alive, and these are of importance to us all. Certain other subjects are of importance to the individual mind, and these are indispensable for the formation of character. But other things again are necessary only to the expert and the specialist. These belong to the later years of education, and should be relegated to their proper place.

Of the educational function of the theatre I cannot speak here for obvious reasons, except indeed to remark that it is a subject upon which teachers should have an opinion, and that here, as in so many other branches of life, they can exert a tremendous influence. Whether we will or no, the love for the theatre is deeply ingrained in human nature. Everybody "makes believe." Let the teacher use his influence to see that this very human propensity is indulged in a worthy fashion.

OUR ESSAY COMPETITION.

THE Prize of HALF A GUINEA offered in our June issue for the best essay on the Naval Harbours of Britain has been awarded to

MARY WINSOR, aged 14,
Girls' Council School, Curledge Street,
Paignton, Devon.

The headmistress, Miss E. Ferris, has kindly promised to supply us with a photograph of the winner, of which we hope to give a reproduction next month.

An extra Prize of FIVE SHILLINGS is awarded to

CHARLES BASIL HITCHCOCK, aged 17,
Secondary School,
Church Lane, Enfield.

(Headmistress, Miss Broome, M.A.), for an essay which in point of quality ties with the above, but is placed second on account of the age of the competitor.

The Editor regrets that among the essays sent in by younger pupils there was not one of outstanding merit. He is, however, anxious to encourage these competitors, and to each pupil who writes him a letter, giving name and private address, before the 6th of August, he will send a small book prize by post.

Words from "Songs of the Nursery." *

RIDDLES.

Music by THOS. J. HEWITT.

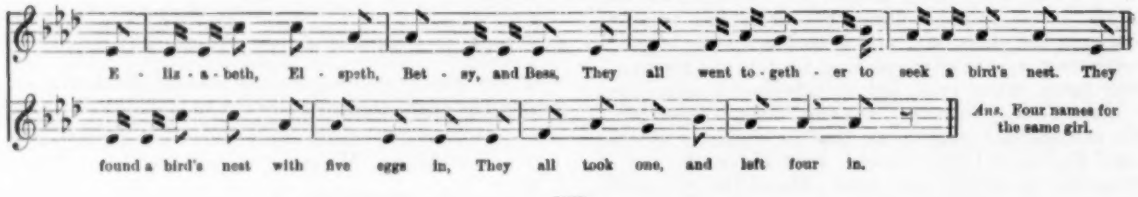
I.

Andante semplice.

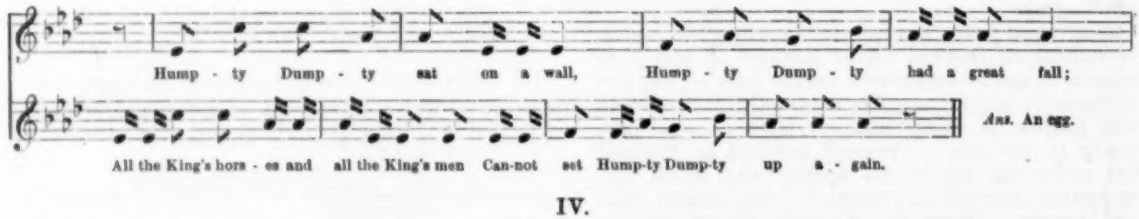
As I went through the gar - den gap, Who should I meet but
f
p
Dick Red-cap! A stick in his hand, a stone in his throat, If you tell me this rid - dle I'll give you a groat.
Ans. A cherry.

II.

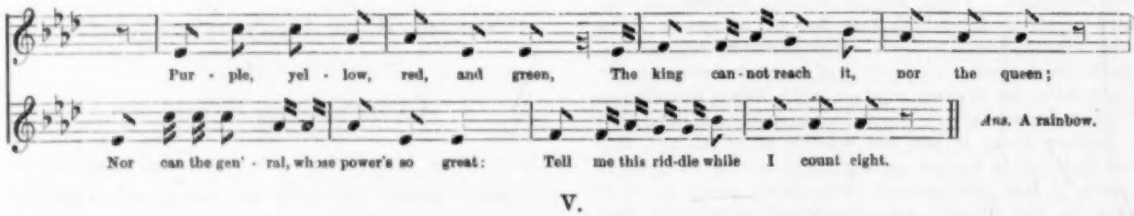
Accompaniment as before.


E - liz - a - beth, El - spoth, Bet - sy, and Bess, They all went to - geth - er to seek a bird's nest. They
found a bird's nest with five eggs in, They all took one, and left four in.
Ans. Four names for the same girl.

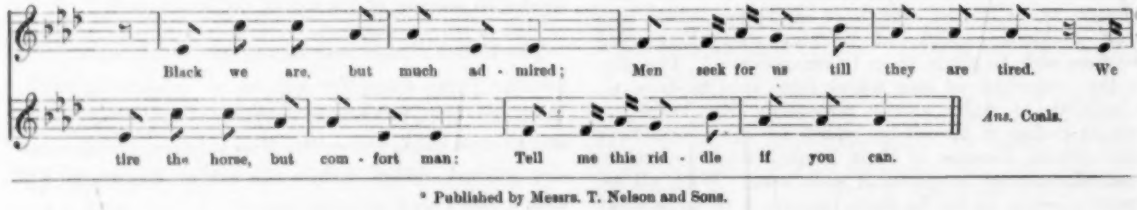
III.


Hump - ty Dump - ty sat on a wall, Hump - ty Dump - ty had a great fall;
All the King's hors - es and all the King's men Can-not set Hump-ty Dump-ty up a - gain.
Ans. An egg.

IV.


Pur - ple, yel - low, red, and green, The king can-not reach it, nor the queen;
Nor can the gen' - ral, whose power's so great: Tell me this rid-dle while I count eight.
Ans. A rainbow.

V.


Black we are, but much ad - mired; Men seek for us till they are tired. We
tire the horse, but com - fort man: Tell me this rid - dle if you can.
Ans. Coals.

* Published by Messrs. T. Nelson and Sons.

French Prize Competition.

1. All French translations **must be received not later than September 6, 1909**, and addressed to :—PRIZE EDITOR, Office of *The Practical Teacher*, 35 and 36 Paternoster Row, London, E.C.
2. Competitors should cut out and send the *coupon* which appears on the Back Wrapper page of the current number. One coupon must be sent for each entry.
3. Competitors should write pseudonym only on MS. Prize-winner will be asked to send name and address for publication.
4. No competitor may take the prize offered more than once in three months.

A Prize of **Half a Guinea** is offered for the best rendering into English of the following extract :—

Avec une habileté diabolique, jouant tour à tour l'animation et l'abattement, selon l'opinion de ses interlocuteurs, décourageant ceux-ci, enflammant ceux-là, paraissant de l'avis de chacun et amenant chacun à son propre avis, Fouché sut associer un même dessein et pousser vers un même but les hommes les plus opposés d'opinion. Aux libéraux comme La Fayette, il dit "Napoléon revient furieux ; il veut dissoudre la Chambre et prendre la dictature. Souffrirez-vous ce retour au despotisme ? Le danger est pressant. Dans quelques heures, la Chambre n'existera plus. Il ne faut pas se contenter de faire des phrases." Aux partisans de l'empereur, il représenta que la fermentation était extrême dans l'Assemblée, que la majorité semblait déjà acquise à une proclamation de déchéance comme l'année précédente. Il insinua qu'une abdication spontanée était peut-être le seul moyen pour l'empereur d'éviter la déposition, de préserver le pays de l'invasion et du démembrement, et de sauver la dynastie. Les souverains, qui n'avaient entrepris la guerre que pour en finir avec lui, arrêteraient leurs armées et ne s'opposeraient pas sans doute à la reconnaissance de Napoléon II. Le duc d'Otrante laissait entendre qu'il avait, quant à cela, par des rapports secrets de Vienne, de quasi-certitudes. A d'autres bonapartistes moins faciles à endoctriner, il dit perfidement que la Chambre était avant tout patriote et que dans l'intérêt public elle ne refuserait pas son concours à Napoléon ; mais qu'il devait se confier franchement à elle, car en présence d'un si grand péril il fallait l'union complète entre l'empereur et la nation. Par ces manœuvres, Fouché rendait l'abdication presque inévitable, et, en même temps, il prenait ses sûretés contre l'événement contraire. Si Napoléon gardait le pouvoir, Fouché trouverait des défenseurs convaincus parmi les familiers du souverain qu'il aurait tout fait pour détrôner.

From "1815," by HENRY HOUSSAYE.

RESULT OF THE JULY COMPETITION.

The prize is awarded to "Aiguille." (Will "Aiguille" kindly forward name and address for publication ?)

First Class.—Alroy, Kram, Oyster, Jean Bonhomme, Poissy, Clio, T. V. D., Eclaireur, Jaune-rouge, Duam, L'Arlésienne, Avril, Guisienne, Aroer, Clapham, La poupée, Du Guesclin, E. R., La Pucelle, Fiat, Lethe, Max, Ailsa mine, Gorse-blossom, Mavis J. P., Ian, Norna, Rursus, Essex, Phebes, Florentia, Sunny, Caliban, Duchlage, K. A. M., Snowdon, Scixio, Cleveland, Mascot.

Second Class.—Elisabeth, Nylmat ii., Fels, Nonnac, Elma, Un pauvre petit, Hélène, June, Danetree, Ivy, Toddy, Llwyddianus.

The prize in the June competition was awarded to Mr. F. C. Webb ("Shekels"), Oakover Girls' School, Burnham, Somerset.

REPORT.

In the passage set there were not many difficulties which in any large number of cases led to mistranslation. *Elle lui en voulait* caught more competitors than any other. In a less degree *frisaient* was a cause of errors. As is often the case, errors were occasionally due to hurried observation of a word. Thus one competitor translated *Elle frappait sur les touches avec aplomb* as "she struck the keys like lead." One paper sent in, and which, of course, we have not marked, contained a translation of the extract set for June 1907.

PRIZE TRANSLATION.

Perhaps she would have liked to confide everything to some one. But how to explain an indescribable uneasiness, as variable as the clouds, as changeable as the wind ? Words failed her as well as her courage, and the opportunity never presented itself. Yet if Charles had wished it, if he had suspected it, if his look had once anticipated her thought, it seemed to her that with a sudden rush of feeling she would have unburdened her heart as readily as a tree unburdens itself when it drops its fruit into the hand held out to receive it. But as their life became more and more intimate, an inward aloofness sprang up which kept them apart. Charles's conversation was as dull as ditch water, and it repeated everybody's ideas in their ordinary setting without exciting any feeling, laughter, or thought. While he had lived in Rouen, he had never been anxious to go to the theatre to see the Parisian actors. He could neither swim, fence, nor shoot, and one day he could not explain to her a riding term which she had come across in a novel. On the contrary, should not a man know everything, excel in the many active pursuits, and initiate one into the strength of passion, the refinements of life, into all mysteries ? But he taught nothing, knew nothing, wished for nothing. He thought she was happy, and she grudged him this deeply rooted tranquillity, this dull serenity, and even the happiness which she afforded him. Occasionally she would draw, and it was a great delight for Charles to remain standing there and to watch her leaning over her portfolio and screwing up her eyes in order to see her work better. As for the piano, the faster her fingers travelled over the keys the greater was his astonishment. She struck the notes with great self-possession, and her hands travelled from one end of the keyboard to the other without stopping. Thus shaken by her, the trembling chords of the old instrument could be heard at the other end of the village if the window were open, and the solicitor's clerk, who passed along the main road in slippers and without a hat, would often stop to listen, with his sheet of paper in his hand. "AIGUILLE."

WALL DECORATION.

WE have received from Mr. Ken Hoshino of Chancery Lane, W.C., samples of Japanese prints which appear to us to be highly suitable for wall decoration. These representations of Nature as seen by the eyes of the best Japanese artists combine the quality of clearness with poetic suggestiveness and delicacy of colouring in a most remarkable manner ; while the characteristic lack of perspective is in itself an attraction to the eyes of the young child, as every student of juvenile taste can tell. Add to these qualities the quaintness, which never fails to bring an appreciative sparkle to the eye of an observant boy or girl, and we obtain artistic material of the very best quality for the purpose. The prints are already in use in a large number of schools, while to many art teachers they have proved invaluable. Mr. Hoshino offers to supply a list of subjects to all applicants, and some idea of the style of the prints may be gathered from our illustrations on pages 66 and 67, though we cannot, of course, give any idea of the delicacy of the colouring.

Our Query Column.

SOLUTIONS BY A. CLEMENT JONES, M.A., PH.D., SENIOR MATHEMATICAL MASTER, BRADFORD GRAMMAR SCHOOL.

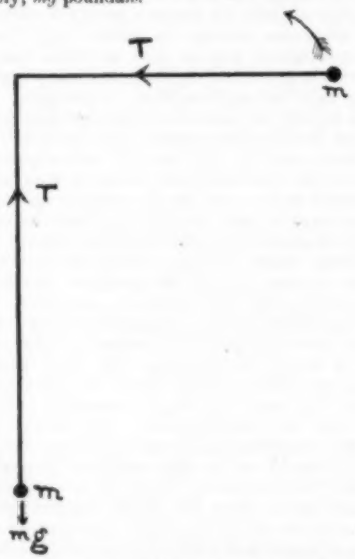
RULES.

1. Each correspondent is restricted to *one* question.
2. Each query must be accompanied by the name and address of the correspondent, and the *coupon* which appears on the back wrapper of the current number of the Journal.
3. CORRESPONDENTS MUST IN ALL CASES STATE THE SOURCE FROM WHICH THEIR QUERY HAS BEEN OBTAINED.

The Editor reserves to himself the right to decline to answer any question which is, in his judgment, unsuited to the Magazine.

Vera.—Two particles of equal mass are connected by a string passing through a hole in a smooth table, one particle being on the table, the other underneath. How many revolutions per minute would the particle on the table have to perform, in a circle of six inches radius, in order to keep the other particle at rest? (Inter. Science, 1907.)

Let T be the tension of the string. Since the hanging particle is at rest, T must be equal and opposite to its weight —namely, mg poundals.



Now suppose the particle on the table makes n revolutions per minute. We suppose it to be revolving uniformly. The circumference of the circle it performs is $2\pi \times \frac{1}{2}$—that is, π feet, hence it moves over πn feet per minute, or its speed in the circle is $\frac{\pi n}{60}$ ft./sec. Since it moves uniformly in the circle, its acceleration is $\left(\frac{\pi^2 n^2}{60^2} \div \frac{1}{2}\right)$ ft./sec.^{2} towards the centre. This must therefore be due to the tension of the string, which is the only force acting on the particle in the plane of the table. Hence Newton's 2nd Law.

$$T = m \cdot \frac{2\pi^2 n^2}{60^2} \text{ poundals.}$$

Hence $$mg = m \cdot \frac{2\pi^2 n^2}{60^2},$$

or $$n^2 = 2 \cdot \frac{60^2 g}{\pi^2} = \frac{60^2 \times 64}{\pi^2}.$$

$$\therefore n = \frac{480}{\pi} = 152\tfrac{8}{11} \text{ revolutions per minute.}$$

Maths.—Integrate the equation

$$\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 20y = a\cos(3x + \alpha),$$

giving the approximate value of y when x becomes a large positive quantity.

Using operators, since the roots of the equation

$$D^2 + 4D + 20 = 0$$

are $-2 \pm 4i$, the complementary function is

$$e^{-2x}(A\cos 4x + B\sin 4x).$$

Let $$y = \frac{a\cos(3x + \alpha)}{D^2 + 4D + 20},$$

and $$y_1 = \frac{a\sin(3x + \alpha)}{D^2 + 4D + 20};$$

then $$y + iy_1 = \frac{ae^{i(3x+\alpha)}}{D^2 + 4D + 20}$$

$$= ae^{i(3x+\alpha)} \cdot \frac{1}{(D + 3i)^2 + 4(D + 3i) + 20}$$

$$= ae^{i(3x+\alpha)} \cdot \frac{1}{D^2 + 2D(2 + 3i) + 11 + 12i}$$

$$= \frac{ae^{i(3x+\alpha)}}{11 + 12i}$$

$$= \frac{a}{265}\Big\{\cos(3x + \alpha) + i \cdot \sin(3x + \alpha)\Big\}\Big\{11 - 12i\Big\}.$$

Equating real parts, we get the particular integral

$$y = \frac{a}{265}\Big\{11\cos(3x + \alpha) + 12\sin(3x + \alpha)\Big\}.$$

Hence the complete solution is

$$y = e^{-2x}(A\cos 4x + B\sin 4x) + \frac{a}{265}\Big\{11\cos(3x + \alpha) + 12\sin(3x + \alpha)\Big\}.$$

When x is a large positive quantity, e^{-2x} is zero, and the second part of the solution lies between $\pm\frac{a}{\sqrt{265}}$. There does not seem to be any point in the question, as $\cos(3x + \alpha)$ and $\sin(3x + \alpha)$ are each indeterminate when x is large.

Rollo.—If $x = f(t)$, $y = \phi(t)$, show how to find the successive differential coefficients of y with respect to x, and find the equation to the tangent and the normal at the point t.

$$x = a\sin t - b\sin\frac{at}{b},$$

$$y = a\cos t - b\cos\frac{at}{b}.$$

Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ in terms of t.

If $x = f(t)$ and $y = \phi(t)$, we can obtain $\frac{dx}{dt}$ and $\frac{dy}{dt}$ by differentiation. Thus

$$\frac{dx}{dt} = f'(t), \quad \frac{dy}{dt} = \phi'(t).$$

Hence $$\frac{dy}{dx} = \frac{\frac{dy}{dt}}{\frac{dx}{dt}} = \frac{\phi'(t)}{f'(t)} = F_1(t), \text{ say.}$$

Again, $$\frac{d^2y}{dx^2} = \frac{d}{dx} \cdot \left(\frac{dy}{dx}\right) = \frac{d}{dt}\left(\frac{dy}{dx}\right) \cdot \frac{dt}{dx}$$

$$= \frac{\frac{d}{dt}\left(\frac{dy}{dx}\right)}{\frac{dx}{dt}} = \frac{F_1'(t)}{f'(t)} = F_2(t), \text{ say.}$$

Then $$\frac{d^3y}{dx^3} = \frac{d}{dx}\left(\frac{d^2y}{dx^2}\right) = \frac{d}{dt}\left(\frac{d^2y}{dx^2}\right) \cdot \frac{dt}{dx}$$

$$= \frac{\frac{d}{dt}\left(\frac{d^2y}{dx^2}\right)}{\frac{dx}{dt}} = \frac{F_2'(t)}{f'(t)} = F_3(t), \text{ say, and so on.}$$

Since $x = a \sin t - b \sin \frac{at}{b}$,

$$y = a \cos t - b \cos \frac{at}{b},$$

we have $\frac{dx}{dt} = a \cos t - a \cos \frac{at}{b}$,

$$\frac{dy}{dt} = -a \sin t + a \sin \frac{at}{b}.$$

Hence $$\frac{dy}{dx} = \frac{\sin \frac{at}{b} - \sin t}{\cos t - \cos \frac{at}{b}} = \frac{2 \sin \frac{a-b}{2b} . t . \cos \frac{a+b}{2b} t}{2 \sin \frac{a-b}{2b} . t . \sin \frac{a+b}{2b} t}$$

$$= \cot \frac{a+b}{2b} . t = \tan \left(\frac{\pi}{2} - \frac{a+b}{2b} t\right);$$

that is, the tangent is inclined to the axis of x at an angle

$$\frac{\pi}{2} - \frac{a+b}{2b} t.$$

Hence the tangent is a straight line through the point t, inclined at $\left(\frac{\pi}{2} - \frac{a+b}{2b} t\right)$ to the axis of x. Its equation is therefore

$$\frac{y - a \cos t + b \cos \frac{at}{b}}{x - a \sin t + b \sin \frac{at}{b}} = \cot \frac{a+b}{2b} t.$$

Multiplying up we get

$$y \sin \frac{a+b}{2b} t - x \cos \frac{a+b}{2b} t$$

$$= a\left(\cos t \sin \frac{a+b}{2b} t - \sin t \cos \frac{a+b}{2b} t\right)$$

$$+ b\left(\sin \frac{at}{b} \cos \frac{a+b}{2b} t - \cos \frac{at}{b} . \sin \frac{a+b}{2b} t\right),$$

or $$y \sin \frac{a+b}{2b} t - x \cos \frac{a+b}{2b} t = (a+b) \sin \frac{a-b}{2b} t.$$

The normal is the perpendicular to this through the point t —namely,

$$\left(x - a \sin t + b \sin \frac{at}{b}\right) \sin \frac{a+b}{2b} t$$

$$+ \left(y - a \cos t + b \cos \frac{at}{b}\right) \cos \frac{a+b}{2b} t = 0;$$

that is, $$x \sin \frac{a+b}{2b} t + y \cos \frac{a+b}{2b} t$$

$$= a\left(\cos t \cos \frac{a+b}{2b} t + \sin t . \sin \frac{a+b}{2b} t\right)$$

$$- b\left(\cos \frac{at}{b} \cos \frac{a+b}{2b} t + \sin \frac{at}{b} . \sin \frac{a+b}{2b} t\right)$$

$$= (a-b) \cos \frac{a-b}{2b} t.$$

We have found that

$$\frac{dy}{dx} = \cot \frac{a+b}{2b} t,$$

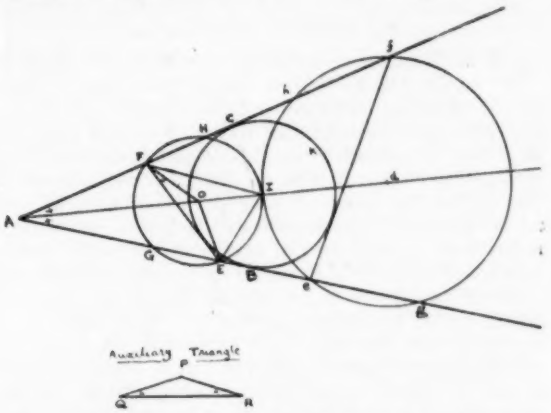
hence $$\frac{d^2y}{dx^2} = \frac{d}{dt}\left(\frac{dy}{dx}\right) \cdot \frac{dt}{dx}$$

$$= \frac{\frac{d}{dt}\left(\cot \frac{a+b}{2b} t\right)}{\frac{dx}{dt}} = \frac{-\frac{a+b}{2b} . \operatorname{cosec}^2 \frac{a+b}{2b} t}{a\left(\cos t - \cos \frac{at}{b}\right)}$$

$$= -\frac{a+b}{2ab} \cdot \frac{\operatorname{cosec}^2 \frac{a+b}{2b} t}{2 \sin \frac{a-b}{2b} t . \sin \frac{a+b}{2b} t}$$

$$= -\frac{a+b}{4ab} . \operatorname{cosec}^3 \frac{a+b}{2b} t . \operatorname{cosec} \frac{a-b}{2b} . t.$$

Atherton Moor.—From a point A tangents AB, AC are drawn to a given circle. Show how to draw a third tangent to the circle to cut AB, AC of given length. Between what limits must the given length lie? How would the results be modified if the third tangent were to be drawn so as to cut the prolongation of AB and AC? (Stage 3, 1905.)



Let BKC be the given circle, AB, AC the given tangents, QR the given length for the third tangent. If I is the centre of the circle BKC, IA bisects the angle BAC.

Analysis.—Suppose EF is the required third tangent in position, so that EF = QR, and let the circumscribing circle of the triangle AEF cut AI at D. Join DF, DE, IE, IF. Since the angles IAB, IAC are equal, the chords cutting off the arcs they subtend on the circumscribing circle are equal, hence DF = DE. And since angles in the same segment are equal,

$$\angle DEF = \angle DAF = \angle DAE = \angle DFE.$$

But EI, FI bisect the angles FEB and EFC,

hence $$\angle DEI = \angle FEI - \angle DEF$$
$$= \angle IEB - \angle IAE$$
$$= \angle EID.$$

Similarly $$\angle DIF = \angle DFI,$$

hence $$DF = DI = DE.$$

Now the triangle DEF is isosceles, its base and base angles are given, the triangle is therefore known in all respects. Further, AI is a given line, and consequently D is a known point.

Construction.—At Q and R the ends of the given length make angles equal to $\frac{1}{2}$BAC, thus forming the auxiliary triangle PQR. Cut off from IA a length ID equal to PQ. With centre D and radius DI draw a circle cutting AB, AC at E, F, G, H, then one of the lines FG, FE and one of EF, EH is the required tangent.

Proof.—If FE does not touch the circle, draw FE′ touching it and cutting AB at E′. Then, as in the proof given in our analysis, there is a point D′ in AI such that

$$D'I = D'F = D'E'.$$

But there is only one point on AI equidistant from I and F —namely, where the straight line through the mid-point of IF and perpendicular to it cuts IA. Hence D and D′ are the same point. But since DE′ = DI, E′ lies on the circle EGFH—that is, E′ is either G or E; that is, FE or FG is the tangent required.

Limitations.—If DI is equal to the perpendicular from D on AB or AC, the auxiliary circle touches AB and AC, and there is only one tangent EF instead of the two EF and GH. This tangent is perpendicular to AI, hence QR must be equal to or greater than the tangent to BKC perpendicular to AI.

Again, if DI is greater than $\frac{1}{2}$AI, the points H and E are the wrong sides of C and B. The limiting case is when DI = $\frac{1}{2}$AI, in which cases AC and AB are the required tangents. Thus QR must be between AB and the tangent perpendicular to AI in length.

Modification.—For tangents cutting AB and AC produced take ID = PQ in AI produced. It will readily be seen that PQ must be greater than the tangent perpendicular to AI which cuts AB, AE produced, and there is no major limit, for the tangent parallel to AB is infinite.

N.B.—You might use that the circumcircle of AEF is fixed in size and R known, and further, that the distance between the circumcentre (O) and e-centre (I) is $\sqrt{R^2 + 2Rr}$, thus obtaining AO and OI, and therefore O.

A FIRST LESSON IN SIMPLE EQUATIONS.

BY PERCY H. WYKES, M.A.

A FIRST lesson in equations is within the grasp of pupils who have been taught the simplest cases of substitution, addition, and subtraction (algebraic), and also multiplication and division by whole numbers. It is best to introduce the idea of equations very early in algebra, as one is able to instil a living interest in the subject by means of easy problems, whereas continual drudgery in manipulating algebraical expressions is liable to produce mental nausea in the pupil, and to create a dislike for the subject which is hard to eradicate.

It will perhaps seem, on reading this article, that my pupils appear to answer too readily. This, however, is in reality not the case, as I have only set down the *ultimate* answer to each question. It is often necessary to ask subsidiary questions in order to obtain the answers which are indicated. It is a good plan to ask these questions indiscriminately, but as a rule the answers to the more easy questions should be got from the weaker pupils.

To begin the lesson, get on the board, by means of questioning the class, the first six lines (see examples), about which there should be no difficulty, as pupils will have done similar work before. When this appears on the blackboard, ask questions of the following type :—

Teacher—When is $3x + 7 = 22$? *Pupil*—When $x = 5$.

Teacher—Is $3x + 7$ always equal to 22 ? *Pupil*—No ; we have just shown that $3x + 7 = 16$ when $x = 3$.

Teacher—What is the value of $3x + 7$ when $x = 1$? *Pupil*—10.

The class will see that $3x + 7$ has different values for different values of x, and that when the value of x is known they may at once find the corresponding value of $3x + 7$. Now propound a question of the opposite kind, namely, What value of x makes $3x + 7 = 52$? (See examples.) This will present difficulty to the class, though it is possible that some one or more may discover the value of x by trial. If this does happen, it is a good plan to ask what value of x makes $5x + 9 = 2x + 15$ in order to show that the method of trial is not always easy. (This equation may appear temporarily on the board.)

Here use what appears on the board to explain—

(1) The meaning of *equation* as "a statement that two expressions are equal, at least one of which contains an unknown quantity."

(2) That this statement is only true for one particular value of the unknown.

(3) That "solve the equation" means "find the value of the unknown for which the equation is true."

(4) That this value of the unknown is said to "satisfy" the equation, and is called the "root" or "solution" of the equation.

Then direct the pupils' attention once more to the question on the board. Draw a rough sketch of a balance, and while so doing explain that the question may be looked upon as a practical problem. "Three equal unknown weights ($3x$) and a 7 lb. weight ($+ 7$) balance weights which total 52 lbs. ($= 52$)."

By an obvious sequence of questions draw from the pupils that balance is kept if (1) equal weights are added to each scale pan ; (2) if equal weights are taken from each scale pan ; (3) if we double or treble, etc., the weights in each ; (4) if we take $\frac{1}{2}$ or $\frac{1}{3}$, etc., of the weights in each.

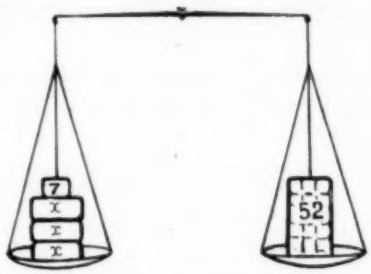
Teacher—How can we manage to keep only "x" weights on one scale pan ? *Pupil*—Take 7 lbs. from each side.

Teacher—What are left ? *Pupil*—$3x$ lbs. in one and 45 in the other.

Teacher—Since these balance, what do you know ? *Pupil*—$3x$ must be equal to 45.

Teacher—What, then, does one of the "x" weights weigh ? *Pupil*—15 lbs.

The contents of the scale pans should be altered at each stage in accordance with the pupils' instructions, and the corresponding written work also appears at the same time. That the correct value of x has been found should be verified orally. By a similar method the second equation on the board should be solved. The



remaining time (if any) should be occupied in solving a few easy equations with the pupils, using the "genetic" method. Pupils should be taught to verify that the correct value of x has been found, and a good method to employ in writing down the work is as follows (I take the case of the second equation) :—

When $x = 2$. Left hand side $= 10 + 9 = 19$,
and right hand side $= 4 + 15 = 19$.
$\therefore$ $x = 2$ is the correct solution.

This will, perhaps, prevent one meeting so often with the wonderful ending,—

"$\therefore$ $19 = 19$. *Ans.*" !

A lesson on the application of equations to the solution of easy problems should be given directly the pupils have gained aptitude in solving easy equations.

Blackboard Examples.

What are the values of $3x + 7$ when x has the values 3, 5, -4, $-\frac{4}{3}$ respectively ?

1. When $x = 3$, then $3x + 7 = 3 \times 3 + 7 = 16$.
2. When $x = 5$, then $3x + 7 = 3 \times 5 + 7 = 22$.
3. When $x = -4$, then $3x + 7 = 3(-4) + 7 = -5$.
4. When $x = -\frac{4}{3}$, then $3x + 7 = 3(-\frac{4}{3}) + 7 = 3$.

What value of x makes $3x + 7 = 52$?

$3x + 7 = 52$.

Take 7 from each side,

$\therefore$ $3x = 45$.

Divide each side by 3,

$\therefore$ $x = 15$.

$\therefore$ x must be equal to 15 when $3x + 7 = 52$.

If $5x + 9 = 2x + 15$, find the value of x.

$5x + 9 = 2x + 15$.

Take $2x$ from each side,

$\therefore$ $3x + 9 = 15$.

Take 9 from each side,

$\therefore$ $3x = 6$.

Divide each side by 3,

$\therefore$ $x = 2$.

NATURE STUDY IN GLASGOW.

BY JAMES KNIGHT, M.A., D.SC., F.R.S.E.

IN these days of aggressive civilisation of a kind, when the open country is yearly being devoured by cities innocent as yet of Town Planning Bills, it is increasingly difficult to get the town dweller, literally "the man in the street," back to the land and into first-hand contact with nature. To some city children in a school we know of all white flowers are daisies, and all yellow ones buttercups or dandelions, with apparent exceptions in crocuses, daffodils, and chrysanthemums, all known through the shops. Of nature knowledge as regards wild flowers there are all shades and depths, from Peter Bell, who at least knew a primrose when he saw it without presuming upon such niceties as "pins and thrums," to the dehumanised expert who would botanise upon his mother's grave. But the ordinary man in the street knows very few wild flowers—a score at most by name or even by sight—and it is a healthy sign when the experiences of his children at the Sunday-school trip or the Fresh-Air Fortnight succeed in renewing his own youth to the extent of a craving for more personal acquaintance with the common objects of the country. Obviously, in treating such cases, the first step is to reveal what is to be seen, for the faculty of observing grows with use—*l'appétit vient en mangeant*—and one has to utilise the expulsive power of a new affection. Taking a lead from Scarborough and other places in England, one or two of our nature lovers in Glasgow conceived the plan of holding throughout the summer months an exhibition of the wild flowers in the Clydesdale area. The Museum authorities granted all possible facilities in the People's Palace, Glasgow Green, and the promoters enlisted the services, not only of the local natural history societies, but of botany classes, professional and popular, rambling clubs, and, indeed, of any one who was inclined to bring back vegetable or floral souvenirs of his week-end or Saturday outing. Although at first nothing more had been attempted than giving the plain citizen a nodding acquaintance with the commoner wild flowers, the scheme caught on to such an extent that specimens came in on all sides, and table after table had to be requisitioned to make suitable display of the floral treasures. Soon it came to be known in sympathetic circles that every wild flower in Clydesdale from Arran to Elvanfoot was to be seen in the People's Palace in its proper season. Botanical students found their way there in increasing numbers to verify or identify specimens; botany classes came with their teachers to study classification; ordinary elementary school classes worked a visit into their "scheme of work;" and the man in the street, for whose benefit the whole machine had been set agoing, found himself sticking an unknown flower in his buttonhole on Saturday afternoon, certain that he would find it duly named and described on Monday morning. No more popular exhibit was ever displayed in the People's Palace, and an overflow of specimens had to be sent to Kelvingrove, for even the West End was beginning to learn of the new wisdom that came from the East. The Corporation, through their conveners of museums and parks, warmly supported the movement, and several demonstration lectures were arranged to enthusiastic audiences on such subjects as "How to name a Wild Flower," "British Ferns, and how to know them," "Principles of Flower Classification," and the like.

Emboldened by success, Mohammed has again resolved to go to the mountain, and on the 1st of May a start was made for the season. The arrangements are again in the hands of Mr. Thomas Lugton, curator of the People's Palace, and he will have the hearty co-operation of the societies as before. Indeed, at the preliminary talk over the season's programme, the suggestion was thrown out that the scope of the exhibition might be widened and at the same time specialised—that special tables, for instance, should be set apart for British ferns and trees; that the flowering plants should be arranged in genera and species instead of for display simply; and further, that a beginning might be made with some of those commoner forms of animal life which every city child reads about and never sees. The life histories of frogs and newts, caterpillars of all kinds, snails and slugs, garden pests and helps, would all prove interesting to the suburban dweller who is sorely exercised over his half-rood or less; while, if the museum were visited only once by every one interested in the green fly and its misdeeds, the attendance turnstiles would run to the sixth figure.

THE TEACHING OF HISTORY.

AMONG the many Memoranda issued and issuing from the Board of Education, Circular 599, on the teaching of history in secondary schools, is by no means the least interesting. It shows how the process of linking up all the segments of our English education scheme is causing an overhauling of everything, even to the methods employed in the schools which were the last to enter the official net—the secondary schools. In these suggestions for the teaching of history, it is interesting to watch how methods known and practised for long years in primary work are put forward as ideals for secondary teachers. This is but natural, since there are no primary or secondary or higher methods—there are only good and bad methods.

The suggestions cover two periods—the first up to the age of twelve, the second from twelve to sixteen. In the first the plan proposed is a well-known and well-tried one. It is to lay the beginnings of historical knowledge by stories—historical stories taken from English history, and from the history of the world generally. Striking and important events, biographies of great and influential people, stories of the great national and world movements, are suggested as the foundation of these early lessons. But an ordered scheme even of the stories and pictures is necessary, so that a coherent idea of the growth of the country can be formed. For this purpose it is inadvisable to separate history entirely from geography; the two subjects mutually supplement each other, and literature, in the shape of reading, helps both.

As the Circular truly says, the period between twelve and sixteen years of age is the period of greatest difficulty, seeing that a scholar is supposed at that later age to have acquired a fairly full and connected view of English history. An accompanying Memorandum has been issued, which contains a sort of official discussion of the reasons which have led to the suggestions of the Circular, and there are many fertile hints contained therein. The "special period," the "longer period" plus "outlines," and the "concentric" plan, the plan which begins with modern history and works backwards—all these are described and discussed in the Memorandum, which will well repay reading by teachers of

every grade. The plan suggested in the Circular is a division of the history course into three chronologically consecutive portions for a three years' course, leaving one year for revision and supplementary detail—a plan which partakes a little of the "concentric" system without its repetition.

Even then it will be found impossible in a year's course to plod meticulously through any one of these three periods, even if it were advisable. On this point the Circular is very lucid and good. A year's work should contain such points of the period as represent the train of development, treated consecutively, all relatively unimportant, obscure, or difficult constitutional matter being omitted or merely glanced at, and left for the revision year. At the same time, such points of contemporary foreign history as are elucidatory and helpful could be taken in connection with the period of home history within which they fall, and geography and literature should be pressed more and more into the service of history. In all this there is sound sense, and much knowledge of school wants and difficulties. Valuable also is the hint that local history should be made much of, though one is filled with wonder that at this late hour the formal suggestion of such a thing should need to be officially made.

It is recognised that the scheme of work suggested is an ambitious one, but there is so much help to be gained from geography, properly taught, and from literature—in novels, poems, travels, explorations—that it ought to be feasible. Classical schools will naturally have organised courses of classical history; and where modern languages are taught with any effect there are texts prepared for school reading from original works, chronicles, etc., which will help the historical scheme while aiding in language study.

The authors of the Circular seem to have scrutinised the field pretty closely, and to have made themselves familiar with practices in vogue and the difficulties ensuing. Their suggestions are marked by knowledge and sound judgment, and much good should follow their adoption. The development of the suggestions is so full of useful matter that we recommend teachers generally to read both the Circular and the Memorandum. It used to be said that the primary schools of England shone by their methods, the secondary by their character. From these two Memoranda it is quite clear that methods which have been tried and proved, though on a less extensive body of material, in primary schools are now making their way into the next grade. An exchange of characteristics could only be of obvious benefit to all concerned.

EDUCATIONAL GLEANINGS.

QUESTIONS AND ANSWERS.

BY T. G. TIBBEY, B.A.

ALL who realise with what little satisfaction to himself or his teacher the average pupil answers questions designed "to promote thought" will be interested in a study made by M. Roger Cousinet, and published in *L'Educateur Moderne* for July 1908, of answers given by a number of pupils to a series of ten questions set with such object. The study was the outcome of a discussion at a meeting of the Société pour l'Etude psychologique de l'Enfant. The questions were as follows :—

1. What are the consequences of taking too much wine? 2. Why is it unhealthy to suck the fingers? 3. Does the swallow fly like the sparrow? 4. What insect do you think the most intelligent? Say why. 5. How do you recognise a newly-laid egg? 6. What is the weight of the brain? of the heart? 7. How comes it that water boils just at 100° C.? 8. Is one able to reduce a material body to nothing? 9. There are some people who believe it is unlucky to sit thirteen at table; show that this is a superstition. 10. If any one told you there was an animal having a man's head and the feet of a horse, you would not believe him. How, then, do you believe in the existence of Louis XIV. and of London, which you have never seen?

Upon careful consideration of the answers given, M. Cousinet found that many of these showed that the writers, rather than consider the problem set, tried to recall some lesson dealing with a similar topic and to reproduce as much of this as possible. This was particularly noticeable in the first question, where the majority reproduced lessons upon intemperance, interpreting "taking too much wine" as "habitual drunkenness"—a conclusion to which some of their elders hastily jump. The answers again to the last question showed what implicit trust is often put in the words of the teacher, or of the book, the same almost superstitious veneration which the ill-trained everywhere show for the printed word, and which explains much of the influence of the modern newspaper.

The tendency also, not confined to children, to seize on one or more striking words in a sentence and infer from them its meaning to the neglect of its proper signification, or, realising their ignorance of the answer required, to substitute something else within their ken, accounts for a large number of wrong answers. But another difficulty was seen to be that the pupils had not clearly understood the meanings of certain terms. The remedy for this—that questions should be set in terms well within the comprehension of those who will be called to answer them—is not always a simple matter for those who have to set questions for pupils of whom they have no direct knowledge, and who thus cannot well judge with what ingenuity some term may be misinterpreted. For both these difficulties, and particularly for the first, much help may be given by training in careful reading of questions; class exercises are useful here, in which pupils are called upon to express in their own words questions dealing with some sufficiently well-known topic, and then to bring out the different points that might be touched upon in answering these, and particularly to see the essential point in the question, and to bring out this clearly. Such work has value even in the world beyond examination papers, where ability to quickly understand the real point of a request or a question is appreciated.

Very few of the answers showed any direct original observation on the part of the pupils; children do not easily reflect, nor readily turn their mind to a new idea. Especially is it necessary therefore, as M. Cousinet urges, to follow up an answer by other questions designed to unfold all that the pupil vaguely means, or to bring out some aspect that he had overlooked. Herein lies, for many subjects, the superiority of the oral over the written examination, and it is as well for those to whom fall the tasks of setting questions and examining answers to remember that not all the blunders arise from ignorance of the subject matter or unskilful teaching.

THE ADVANCE OF PHYSICAL EDUCATION.

BY HERBERT LEATHER.

OF special interest to all teachers and educationists, in view of the modern conception of our primary schools as places where the physical development of children is no longer regarded as of secondary importance to the intellectual, is the Report of Dr. James Kerr to the Educational Committee of the London County Council.* In reviewing the whole field of medical inspection in London schools for a period approaching two years, a short account of the medical department is given. Commencing with a solitary medical officer twenty years ago, the staff now consists of sixty-eight members and fifty-four school nurses, and the department comprises four sections for—(1) the examination of candidates for employment in schools, scholarship candidates, etc.; (2) medical inspection of schools, including the detailed examination of scholars, school conditions—lighting, heating, ventilation, furnishing, etc.—and the health and work of the teachers; (3) the organisation of effective methods of securing cleanliness and disease prevention, etc.; (4) special school work.

Reference is made in the report to the difficult questions as to the extent to which teachers shall be made responsible for the work of medical inspection, and a pamphlet is promised at a later period bearing on the teacher's part in the new system. It would appear that this may be expected to include the noting of the height, weight, visual acuity, keenness of hearing, and the want of clothing or personal cleanliness of pupils. The chapter bearing on the question of underfed children emphasises the difficulty experienced by nearly all teachers in selecting such cases. "The detection of an underfed child is by no means so easy and straightforward a matter as at first sight might appear. In point of fact, there is no certain criterion of these cases," runs the report. Dr. Guest suggests two standards in judging whether a child requires to be specially fed at school—(1) The social circumstances of the parents; (2) the physiological condition of the child. But he points out that "in children in obvious need of feeding from their physiological appearance, the parents' circumstances were often good, and *vice versâ*."

A passing reference to the good results to the children of the poorest districts who attend vacation schools is succeeded by a report on School Excursions, sanctioned by the Board of Education under Article 44 of the Elementary School Code. Teachers will be glad to know that the doctors speak in terms of the strongest approval of such journeys, and state that there is everything to commend this new extension of school work from the view of health and physique. A word of warning is given as to the advisability of subjecting pupils with weak hearts to undue strain when taken on such excursions; and it is recommended (1) that prolonged exercise should be avoided when the pupils show signs of fatigue, (2) that a considerable interval of rest should be allowed during each period of twelve hours.

Some very practical tests for detecting strain caused by incorrect methods of teaching needlework should prove greatly helpful to teachers in girls' schools. These tests in summary are—(1) A bad position of the body, the work usually being pressed close to the chest, entailing a stooping position and rounded and high shoulders; (2) squinting, which indicates eye strain; (3) corrugated forehead, knitting of the eyebrows, etc.; (4) twisting of the body and neck; (5) grimacing. It is also recommended that the use of dazzling white canvas, and working in red wool on white canvas, should be prohibited; in fact, it is maintained that red colours, on account of their irritant visual qualities, should no longer be used, while coloured cottons and wools should be restricted to blues and greens. "From October to March," runs the report, "no needlework should be allowed after 3 p.m., and during November 15 to February 15 no needlework should be allowed in the afterncons at all. Artificial light in school is practically always insufficient for this work." Dr. Woodcock maintains that it is unscientific to teach fine sketches on fine materials to children of six or seven years of age, since the practice causes considerable eye strain and general nervous tension, and that hemming and over-sewing should not be taught before the age of nine or ten years. At the present time she concludes that technical excellence is striven for without regard to hygiene.

In the chapter dealing with the work of nurses the following significant conclusion is indicated: "The allegations that children are mostly infected in school cannot be true to any extent, *as in every district the condition of the children is always worse after the holidays.*" A statement of this kind should prove a very formidable obstacle to those economists who would exclude all infants under five years from school attendance. As Mr. Ernest Gray recently pointed out, such a policy defeats its own ends by propagating a type of physically and mentally afflicted children which finds a destination in the workhouses or on the streets.

The part of the report dealing with infectious diseases and the prevention of the spread of disease is of special interest to all teachers. It is advised that all cases of languor, drowsiness, headache, sore throat, and vomiting should be carefully watched by the teacher; that *all* children with sore throat, whether scarlatinal symptoms are present or not, should be excluded from school attendance; and that where symptoms of infectious sickness are observed, the names of those sitting next, or those who accompanied the child to or from school, should be taken, in order that suspicious symptoms may be watched for in the suspects.

Reference is made to the anomalous case of feeble-minded children, who, after being under the care of the education authority until the attainment of the sixteenth year, are allowed to drift into the world subject to no permanent control, at the mercy of the unscrupulous, and with uncontrolled liberty to perpetuate their weaknesses in a second generation within the shadow of the slum or the sheltering walls of the poorhouse.

The magnificent success which has attended the open-air school experiment aptly closes the medical officer's report: "Every child benefited physically by attendance at the school; the general improvement was greater than could have been anticipated, and in some instances was remarkable."

No one who reads the report can fail to note the stress which is laid upon the necessity for physical fitness as the *first* essential in any scheme of education. And every educationist should read it.

* "Report of the Education Committee, London County Council, submitting the Report of the Medical Officer for the twenty-one months ended December 31, 1908." P. S. King and Son, Great Smith Street, S.W. Price 2s.; post free, 2s. 3d.

THE WORK OF THE LONDON CHILDREN'S CARE COMMITTEES.

BY CLARA E. GRANT.

TO some of our readers the term "Care Committee" may be unfamiliar, and we may be forgiven if we explain that it refers to committees specially formed in connection with the poorer London County Council schools for promoting the physical and social welfare of the children attending them. Teachers working in the poorer schools of our great cities have known only too well the hampering effects of poverty on their children—the disastrous effects too on the educational "results" so eagerly looked for in years gone by. Insufficient or improper food, scanty clothing, overcrowding, lack of healthy sleep, child labour—all these are obvious handicaps to a child in school; whilst frequent illness and "removals" seriously affect the regularity and continuity of his attendance; and the problem of "The Poor Child at School" has become really acute, both from the humane and from the national point of view. In the interests of pure humanity countless teachers have laboured to ameliorate the lot of these little ones, organising meals for them, and begging the necessary funds and also boots and clothing from their friends, or too often aiding them from their own hardly-earned salaries, whilst clergy and ministers, managers and others have also given their aid.

Valuable and devoted, however, as these efforts have been, they are obviously inadequate, and the problem has become a serious burden to the teachers; whilst it is equally obvious that, though serving to focus attention on the problem and mitigating to some extent the sufferings of the children, these efforts are not sufficient either to cover the needs of the children or to strike at the root causes of the problem. Something far more systematic and adequate must be attempted if the social problem of the poor school is to be solved; and the formation of the Care Committees in London schools is certainly a step in the right direction, and we may turn at once to their constitution and function.

The Constitution of the Children's Care Committees.

The Children's Care Committee usually consists of the head-teachers, two or three representative managers, the attendance officer, and certain co-opted members, either local workers already well in touch with the needs of the neighbourhood, or newer members anxious to gain experience in social work. The presence of the head-teachers at the meetings enables them to give their own experience and impressions of the children and their needs, with any knowledge gained from parents visiting the school, whilst they are relieved, and rightly, from the individual responsibility of selecting children for meals, etc. The impressions gathered by teachers relating to children only as they appear at school are, of course, useful, but they can never be considered final; for it often happens that children appearing clean, tidy, and even robust, come from the poorest homes, where the struggle for existence is being fought on unobtrusive and self-respecting lines, and these are the families deserving the most consideration. On the other hand, some of the most ragged and squalid children come from homes where money is found but spent badly, and though these children need care and observation and aid where necessary, there are cases where warnings should be given to the parents, or some more drastic action taken. If the school Care Committee is to gain a reputation for justice amongst the parents generally, the most careful discrimination must be made between these types of cases, and that can only be secured by a system of thorough visits in the homes. There is perhaps no point on which parents are more sensitive than on this question of "deserts," hence the need for the utmost care and wisdom. The fact that all head-teachers come together for this purpose is incidentally of importance, as it secures co-ordinate action. Too often in years gone by the three departments of a school have acted in absolute independence, and hence three varying standards may have been applied to one family.

The presence of the managers gives an opportunity for bringing their colleagues as a whole into relation with the social needs of the school. In fact, so little and so comparatively uninteresting is the proportion of administrative work which it is safe to leave to varying bodies of managers that many people will not come forward who may yet be attracted by the social opportunities afforded them in Children's Care Committee work. The attendance officer can often give valuable information gathered in his rounds, especially of those irregular children whom he knows so well and who are so often amongst the applicants for meals, etc. Local workers, who so often work in a dangerous detachment from each other, can be effectively grouped round that unifying centre—the common school—whilst to would-be social workers the Care Committee offers a convenient centre for both training and experience.

In some cases, where the number of necessitous children in a school is very small, two or more schools are grouped under one Care Committee; but as a rule the individual school is the best centre, especially from the point of view of the teachers, who cannot be expected to give time or interest to the children of other schools when their own are already making somewhat heavy demands upon them, nor do they wish to absent themselves from school to attend committees held outside.

If possible, the secretary, for obvious reasons, should not be a teacher, though too often at present teachers have to undertake this work for lack of efficient outside help.

The Work of the Care Committees.

Originally starting with the special work of feeding children, the scope of the Care Committee work has been very materially widened, in ideal at any rate. So many and varied are the needs of human life that "food" can only be regarded as one factor amongst many; and, in the course of study and investigation, both of the child and of his social surroundings, all these other cognate needs of the child have been discovered, and a wise Care Committee, with a comprehensive conception of its duties, will not rest until the child is provided with every one of those primary essentials of life, for lack of which the poor child is now so severely handicapped. It is of no use to argue that these things should be provided in the homes. We look for the day when that will be possible, but in the meantime, until social conditions are improved by strong and drastic action only conceived of at present, something has to be done if the education of many of our children is not to be rendered difficult in practice and futile in result.

(*a*) *Feeding.*—The first direct duty undertaken by the Care Committee will probably be the provision of meals for children obviously underfed or badly fed. The actual organisation of the meals, with its financial responsibility, will be probably undertaken directly by the Education Authority, though the Care Committee may render help in securing efficient service and supervision, but the selection of children will rest with the Care Committee, and, therefore—

(*b*) *The Visiting of the Homes* will be an important part of the work, and this is certainly the most delicate duty of all. To visit children's homes for purely social and friendly reasons, to bring the school and home into closer relation with each other, is an easy and delightful task, for friends of the children are always welcome. But the careful investigation into the financial circumstances of the home where material aid has to be given is a much more delicate task, requiring the greatest tact and tenderness combined with insight and firmness. At the same time, if the parents are helped to understand that such information is necessary in order to avoid abuse of public funds, and also in order to secure reliable evidence as to the social conditions of the neighbourhood, they will usually respond frankly and willingly; whilst the visits of a sympathetic and tactful "friend" should be most fruitful, tending to raise rather than lower the parents' sense of responsibility.

Certain children, not exactly on the poverty line, will perhaps need milk at lunch-time, to the cost of which parents may be able to contribute; whilst cases of very dire need, in which the daily school meal is utterly inadequate, should be referred to the local Poor Law officers. Of course, pending their action, the child must be fed, since the Education Authority cannot escape from its responsibility to feed every necessitous child; but it is well to remember that there are certain chronically hopeless cases, in which small doles only serve to perpetuate a fatally low standard of living. In cases where such distress is due solely to economic and industrial reasons—for example, lack of work—the State should make up its mind to provide work; but where the home remains hopelessly bad from moral reasons, after all appeals have been made and every resource exhausted, it would seem best to be "cruel only to be kind," and either force such families into the Poor Law institutions or establish penal colonies for the erring parent, and make due provision for the remainder of the family. It is these cases which, though not really many in number, are the despair of Care Committees. Indeed, to quote a bold conclusion put forth by Mr. Robert Blair, L.C.C. Chief Education Officer, in a recent report on this matter:—

"While much curative work can be done, there are a good many cases of homes so bad that they cannot be mended, and their ending must come as the result of a measure of Poor Law reform, which, it may be hoped, will set up a requirement of a minimum of comfort and respectability as the condition of continued existence of any home."

(*c*) *Clothing Clubs, Boot Clubs, etc.*—Ill-fed children are naturally very often ill-clad too, though here we find a certain danger of hasty generalisations. It is comparatively rare to find children, even in a very poor school, absolutely underclad, thanks to cheap old clothes shops and skilful mothers or neighbours willing to "make" for a mere pittance; and there is no doubt that children, if at all hardy (and it is the comparatively hardy who survive), easily become inured to a somewhat low minimum of clothing. The chief troubles are the insufficiency of change of garments, with consequent infrequent washing, and the "cheap and nasty" goods of the "old clothes" shop, and the boot problem. The poor streets of the city are not suited to bare feet, bad sores being a frequent result; and, rightly or wrongly, poor people do regard "boots" as a sign of respectability. There are very few people who do not.

Boots and clothing therefore will probably have to be provided, and this should always be done through thrift clubs or by sales, if possible, free "giving" being an exceedingly dangerous procedure, and one, moreover, not appreciated by the more self-respecting parents. Where a Settlement or other local resources exist, a work fund is useful for assisting parents to pay for clothing, but that is, of course, not easy to work through the school.

(*d*) *Delicate Children.*—It should also be the duty of the Care Committee to watch over dull and defective children, to arrange for medical inspection and treatment, country holidays, etc., and especially to see that *they are not mentally overpressed at school.* A spectacle club will be useful for children with defective sight, surgical instruments must be obtained, and so on, using, of course, any available funds or societies existing for that purpose.

(*e*) *Employment.*—Last, but not least, the Care Committee will do its utmost to secure suitable employment for the boys and girls leaving school, and to bring them into touch with local employers, and perhaps, by the aid of local institutions, develop social and recreative clubs for them. It is at this period that the most wasteful "break" of all occurs in the lives of our children—the break which frees them from the wholesome school control, and turns them adrift probably into unskilled labour by day and the streets by night.

It is thus that the Care Committee will watch over the children on the physical and social side of their welfare, and no conception of education is really complete unless these needs are met, for only in this way can the child be said to be equally and harmoniously developed on all sides of his being.

MEDICAL INSPECTION IN KENT.

BY E. J. COOKE, SIDCUP HILL.

SOMEWHAT late in point of time a scheme for the medical inspection of scholars under the enlightened charge of the Kent Education Committee was sprung upon the teachers of that county in November of last year. Dr. Howarth, the county medical officer of health, held a series of conferences with teachers in various parts of the county, with the result that sensible modifications have been made in the methods proposed originally, and there now appears little to which the teaching profession can take exception.

The work is carried on by part-time medical officials, each of whom has a certain definite area in which to work. During the present year children who will attain the age of five in 1909, and who are described as "entrants," will be examined, and also others known as "leavers"—that is, those who are thirteen years of age and upwards. Next year, in addition to the classes mentioned, children of seven years of age are

to be included, and in the following year a further addition will be made—namely, those children who will be ten during that year. Hence it follows that after two years, when the scheme is in full working order, provision will have been made for each child to be inspected four times during the course of its school life.

At least a week's notice is given to the head teacher of a school which a medical officer proposes to inspect. The notice also states the number of children that may be submitted, and the necessary age description. Children to this number are selected by the teacher, who may include any exceptional cases arising amongst scholars of ages other than those prescribed for that particular visit. A written notice is sent by the head teacher to the parents of any child selected for inspection, and such notice states that they (the parents) may be present. In the particular case of the writer's school, twenty-seven notices were sent to parents. At the time of giving out the notices a brief explanation was given to the scholars interested, and it was requested that any parents who objected should write or interview the headmaster. The parents of two girls of fourteen years of age objected on the ground that they did not consider the inspection necessary, and hence twenty-five scholars were presented for inspection. Of this number twenty-one were "leavers," two others considered by the headmaster as mentally deficient, and two selected for examination because of suffering from sore eyes.

Before the day appointed, the teacher entered on the card provided various particulars that could be obtained from the school registers. In addition, each child was weighed, and height measurement taken. These results were also recorded. Further entries made expressed the teacher's *opinion* on the nutrition of the child, the cleanliness of its head (or otherwise), the sufficiency of its clothing, the condition of that clothing, and the state of its footwear. In expressing "opinions" only, the figure 1 = good, 2 = moderate, 3 = unsatisfactory. Where any doubt is felt, the matter may be left to the doctor. But in passing it may be well asked what state of "cleanliness" of head can be represented as moderately clean? A child's head is either clean or it is not clean, and it is playing with the question to weakly allow a middle course.

It should be stated that no examination by the teacher is authorised by the Education Authority—indeed, such is expressly forbidden. And rightly so, for that is the work of the school nurse, a luxury at present denied to the schools of Kent. Hence the reason is seen for using the word "opinion" above.

Now to the inspector's visit. I was fortunate in being able, without much dislocation of the usual routine, to provide an empty classroom. In that room were placed desks for scholars, a table and chair for the doctor, paper, ink, etc., and a second table on which stood two bowls, towels, Cyllene soap, and a sponge.

The medical officer for the district, Dr. Theodore Fisher, arrived at 2.10 p.m. Dr. Fisher is a man pre-eminently qualified for the work, for, apart from his reputation as a specialist amongst children—a reputation which is European—he is a man with whom it is a delight for a teacher to work, and he has the greatest sympathy with all that pertains to the good of schools and scholars.

The work began, there being present, in addition to the doctor and head teacher, the chairman of the managers of the school. In passing, it may be of interest to state that Dr. Fisher assured the writer that in only one other school of all he has visited was a manager present. Thirteen boys were first examined. Each child had his right and left eye tested in the usual manner by reading various sized letters at a distance of twenty feet. In order to test the power of hearing, the boys were provided with paper and pencils, and were requested to listen to a whispered sentence given out by the doctor, who stood twenty feet from them. The sentence, or as much of it as they heard, had to be written on the paper. In every case the power of hearing seemed perfect in those undergoing the test. After that, each boy in turn came forward, and the doctor tested and examined the teeth, ears, nasal organ, and throat. The last stage was the testing of the heart, lungs, etc. The boys loosened their clothing and bared themselves at the chest. Appropriate entries were made on each child's card, and if any lad showed trace of disease or deficiency the doctor discussed the matter with the head teacher.

Rather interesting was the case of a boy who suffers from "word-blindness." This lad cannot recognise at sight any word, even though it may contain but three letters. Before he can tell the word he has to spell it mentally.

The girls were next examined in a similar manner to the boys. During the latter stages of their examination the senior assistant mistress of the staff was present in lieu of the headmaster. But the doctor required no undressing of children as has been done in schools outside the Kent area, and there was nothing to offend the most susceptible or sensitive parent.

The attendance of the parents was far lower than anticipated—in fact, in two cases only. The general health and condition of the children were excellent; but one girl, as anticipated, was recommended as a fit subject for instruction in a school for mentally defective children. Whether she will ever see the inside of such an institution is doubtful. In three cases warning was sent to the parents requesting them to secure medical attention to their child's eyes. Two girls had heads "moderately clean." The only other defect noticed was what might be expected—a few children had one or more decayed teeth. On the other hand, the cleanliness of the teeth was in almost every case perfectly satisfactory.

The time taken to inspect the twenty-five children presented was slightly over two hours. After the dismissal of the scholars the building and outside offices were inspected and pronounced to be "highly satisfactory."

The scheme in general seems quite workable, and although the amount of work devolving upon the head teacher is considerable, it would seem that no other person is capable of doing it so satisfactorily. The weakness in the present scheme is that little or no effort is made to secure greater personal cleanliness, but amendment in this direction is promised. And no scheme can be satisfactory or beneficial which does not provide for periodic visits from a school nurse attached to each group of schools.

OUR QUERY COLUMN.

THE Editor apologises to querists whose solutions are crowded out this month, and asks them to lay the whole weight of the blame upon him, and to exonerate Dr. Clement Jones, whose answers are now in hand, and will be printed next month.

CORRESPONDENCE.

THE PRIMARY SCHOOL AS A PREPARATION FOR THE SECONDARY SCHOOL.

To the Editor of the "Practical Teacher."

SIR,—It is the fashion just now to attack the elementary school teacher and his work. "He has no friends; set at him," is the cry, and the article by a "Secondary Teacher" is typical of the way in which inaccurate and misleading arguments are bolstered up by the recital of a few isolated facts. As a teacher your contributor should know that the general must not be assumed from one particular case.

A "Secondary Teacher" claims to have taught in an elementary school several years ago, and therefore is qualified to settle off-hand any and every question connected with the curriculum of a primary school. This seems to me to be just as reasonable as it would be for a person who lived, say, in Middlesbrough thirty years ago and has never revisited the place to claim to be the sole authority on the proper municipal methods to be adopted in that town.

Liberty of curriculum is said to have degenerated into licence. This surely is a somewhat bold statement for an outsider to make, and, worst of all, no proofs whatever are produced to support it. I maintain that we have in reality less freedom than we had in the "bad old days," when the standard and number of subjects were fixed and a point to be aimed at proposed, and this point varied but little from year to year. Now, you may say, the head teacher frames the syllabus. True, but it has to meet the inspector's wishes, and it is no uncommon thing to find one visiting inspector entirely reversing the *suggestive commands* given by his predecessor. In such cases freedom reaches its vanishing point.

In another direction this much belauded liberty is a huge system of tyranny. I refer to districts where a few teachers are playing the game of "Beggar my neighbour." A wishes to do something grand, and therefore starts a violin class. Then B, C, and D must follow suit, or they are not *up-to-date*. So with cookery, gardening, woodwork, and several other subjects. What this means to the teacher of three, four, or five standards many of your readers know only too well.

"Secondary Teacher" also betrays his entire unacquaintance with primary work when he speaks of correlation. In every school, except the very smallest, coins, weights, measures, and rulers are provided for the pupils' use, and at least two lessons a week consist of practical work. I do not know of a single school where history, geography, and drawing are not linked as a connected group, and the cheap sneer at the teaching of elementary science and primary drawing must surely emanate from one who has never seen the Honours Pages of the *Practical Teacher*.

The examination idol is, as usual, brought into view. How many examinations would be sufficient? At present the head teacher conducts three or four examinations each year, the inspectors give a semi-examination in certain subjects—ordinary, drill, music, drawing, handicraft—and these last may be sprung upon the unhappy class teacher at any moment. Surely, if anything, we have over-examination.

The secondary and the primary school are compared with regard to home work, and here it is truly said that the parents' attitude is hostile. Even for ordinary lessons the primary teacher is at a disadvantage. It is no uncommon thing for a head teacher to receive some such message as the following: "If you worry my child about his (or her) sums, I am not going to send him (or her) to your school any more." But a class teacher counts for sixty in a primary school, and the authorities demand that all the lessons he gives each day shall be written out either in full or with very full notes. In addition, many lady teachers have needlework to fix, etc., in the evenings. Under these circumstances where are the setting, correcting, and revising of home work to come in?

Lastly, I would invite "Secondary Teacher" to study the speeches, especially of ex-President Pickles, on the question of preparing for outside examinations. The N.U.T. Conference spoke on this subject with no uncertain voice, and if "many of the best teachers want outside examinations introduced," very many more have decided that it is unwise, inexpedient, and harmful.—I am, sir, AN ELEMENTARY TEACHER.

To the Editor of "The Practical Teacher."

SIR,—In answer to your offer, I, as a primary teacher of upper standards, beg leave to make reply with regard to the charge "that the pupils of primary schools lack initiative, self-reliance, and desire for knowledge."

My reply is not a denial, as the "secondary teacher" is in a better position to judge than myself, but I do wish to suggest an explanation of this condition of affairs. Many of our superiors enter a school to inspire us by helpful criticism and impress the doctrine that method is everything and accuracy nothing; that an intelligent arrangement in working out an arithmetical problem is of far more consequence than obtaining the correct answer. In other words, teachers should be educators, training the mind, and, providing the pupils have been led in the right way, facts are of little importance. This applies not only to arithmetic, but to all subjects.

Now I contend that, with some teachers, this opinion heard from the lips of an H.M. Inspector results in good methods of teaching in so far as it refers to the training of the mental faculties, but not in impressing the facts, so deduced, upon the pupils' minds.

A teacher's aim should be to give the pupils as much definite information as possible by the best methods, but the test of such teaching should be the pupil's written work itself. In this case we must

"Dare to be a Daniel,
Dare to stand alone."

By pinning our faith to unaided written answers as tests of our oral lessons, we shall train our pupils in initiative and self-reliance, which are outgrowths of original efforts. When they realise that hard facts have a marketable value, they will appreciate information, and thus generate a desire for knowledge.

That original written exercises in "English" are poor is undoubtedly correct. This, I think, is due to the fact that by "composition" teachers understand essays; and, worse still, prepare these in class, with the result that all are practically similar in phraseology, arrangement, and matter, originality being conspicuous by its absence.

Now as a remedy I suggest, forget such a word as "essay." Give much more practical letter-writing, such as the pupil actually requires for everyday life—for example, to write to aunt saying mother is unable to go next day to tea—give reason; to write answering an actual advertisement in the paper; to write to father's employer explaining his absence from work.

Also to write unaided answers to unprepared questions, and follow such exercises by oral corrections and suggestions from the class.

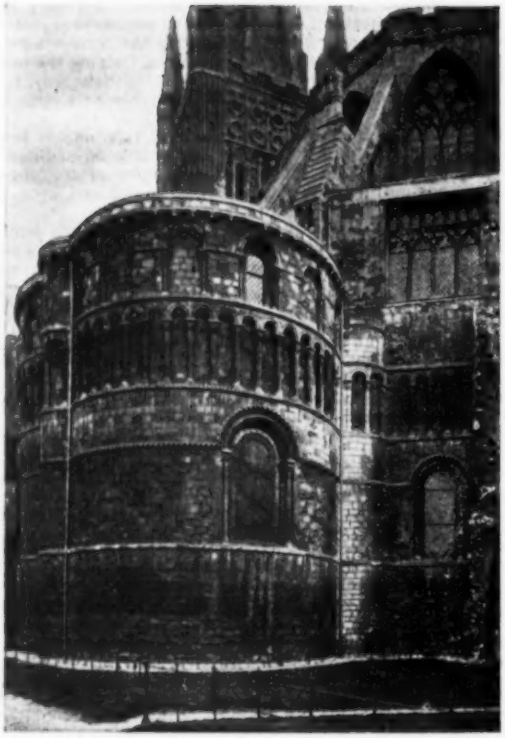
This would tend to correct the lack of thoroughness and self-reliance.

Re the introduction of examination for upper classes. Although one whose pupils have gained successes in Oxford Local and other outside competitive examinations as a result of class teaching, I strongly oppose the suggestion for an examination of upper classes only. Head mistresses are allowed to frame their own syllabus of instruction. This causes trouble in a general outside examination. If all are to teach according to the law of the Medes and Persians, then good-bye to freedom and originality.

Personally I prefer to abide by the head teacher's examination, with supervision by inspectors. I would alter the systems of awarding scholarships to secondary schools—abolishing the age limitation, and allowing the head teacher to choose future candidates according to the ability of pupils whose parents would allow them to profit by secondary teaching. To me it seems absurb that a child of humble parents should be sent at ratepayers' expense to a secondary school, and then leave for factory work.

Re the sin of omission of home work. We primary teachers have to deal with children of working-classes, who often need the assistance of our scholars after school hours, to help to earn a few pence, or "take home work." Then we have the fond father who thinks his child "does enough in school." Also we have not the support of our superiors on the Council to insist on home work. However, much may be accomplished by tact. Then the question arises as to the nature of home work; and together with this comes the fact that the majority of primary teachers are class and not subject teachers, and have no "time off" for correction. Our school written exercises take a considerable portion of our evenings. I therefore prefer memorising for home work, which is tested by written answers at school. Is it very dreadful to add that, in my opinion, home work as given by the secondary school is a farce? In many cases the pupils copy the sums from one another. I have seen and heard it in the waiting-rooms of the railway stations, and the written exercises can be transcribed or possibly paraphrased from the text-book taken home for the purpose. Written work to be of value should be the result of assimilated facts, and given as a test under supervision at school. Having hurled my bomb, I beg to conclude, and remain, yours faithfully, A PRIMARY HEAD MISTRESS.

The Editor's Bookshelf.



From Messrs. G. Bell and Sons' "Cathedral Series."

HERBERT SPENCER—THE MAN.*

BY W. H. WINCH, M.A.

IN a somewhat vague way it is generally known to teachers that Mr. Herbert Spencer was a great English philosopher. This term is not exactly one of reproach in England, yet I am sure that most of us surmise that a philosopher, as we understand the term, is rather an uncanny person. Where we feel and act, where with us action, if it does not precede thought, involves usually only just so much thought as will set us doing something, however pointless—a philosopher, on the other hand, we think of as loftily removed from these penalties of the flesh: he does not feel, we fancy, he only rationalises; he does not want, he only knows; he does not love anything, he merely takes an intellectual interest in it; he does not hate, he is too mentally well-balanced to detest anything. Sometimes, indeed, we employ opprobrious epithets, as when Carlyle called that beauty-loving and tender-hearted soul—John Stuart Mill—a logic-chopping machine. Indeed, the critics of Mr. Spencer's great volumes of autobiography, even many of the cultured ones who are more than tinctured with philosophy themselves, have brought away from their perusal a proud, cold, loveless picture; without much human frailty, but also without much human affection.

Personally, I do not thus read the autobiography. I recognise, indeed, the proud sensitiveness which shuns to assert affection—above all, which avoids exaggerated expression of it; and I feel all through Mr. Spencer's life a desire for complete and exact justice, and an endeavour to give it to others in the fullest measure, which, of course, excludes all emotional waywardness.

But I did not, and do not, think of Spencer as emotionally feeble. And this feeling of mine is strengthened by a perusal of Dr. Duncan's book. Any one who wishes to read at moderate length—the autobiography is too lengthy, except for experts—what our English philosopher was like, how he looked, how he worked, what he learned, and how he played—though to me Spencer's play is too consciously a preparation for work, and hence, in the true psychological sense, is not *play* at all—must go, and will go, to Dr. Duncan's book. His task is a difficult one: it is not easy to charm us anew with a retold tale; and sometimes he will not relate an important incident because it is narrated fully in the autobiography, as happens on page 145. And this is awkward for the general reader.

But such criticism is rarely justifiable. On the whole, it is truer to say that he gives us a clear, coherent, complete, and outstanding account—a real life of Herbert Spencer. Spencer himself was too concerned to tell us what he thought to tell us much about how he felt and what he did; Dr. Duncan rectifies the omission. We learn now, in a way we cannot easily forget, of his steady family affection, of his staunchness to his friends, of his generosity to all whom he could worthily help. Withal he was a fighter. Huxley was surprised that two such combative tykes—"especially you," as he wrote to Spencer—had never quarrelled, for neither counted the cost if he felt that error had to be dispelled.

So far, I have not been using the chalk and blackboard; there is nothing in this article for teachers who are not, in some sense, partakers of the currents of modern European thought. I will now become a little more professional. The training college syllabus used to prescribe Spencer's *Education*, of course, so that most of my readers will have some acquaintance with him, but not, I fear, at his best. He loved the human sciences, but his book on education has been a mighty force on a non-humanistic side. He loved beauty. He wrote quite deliberately, "The æsthetic development of life would, in the future, take a larger development than now;" but his educational work scarce gets beyond the science in art. He condemned militarism, he detested Great Englandism, but his panegyric of physical education has helped to boom the things he hated. His plea for hearty feeding for young animals has helped to validate the cry of those who ask for good food for children, even at State expense—a project which he bitterly denounced. His own delicate susceptibilities were, of necessity, shocked when action in accord with his adage—that the first requisite to success is to be a nation of good animals—brought brutality as well as, if not instead of, vigour. He suffered from overwrought mentality, so he thought that children must do so too—it is so hard not to project our own diseases into others. He was, indeed, the last of the great Individualists. We are all Socialists now, it is said; but,

* *The Life and Letters of Herbert Spencer.* By David Duncan, LL.D. London: Methuen and Co.

CLOUGH'S CORRESPONDENCE COLLEGE

TEMPLE CHAMBERS,
LONDON, E.C.

THE OLDEST AND MOST SUCCESSFUL CORRESPONDENCE COLLEGE.

Preliminary Certificate 1909.

REMARKABLE RESULTS.

2 Students of Clough's Classes for Preliminary Certificate 1909 each obtained 6 DISTINCTIONS.

Besides large numbers with 1, 2, 3, and 4 Distinctions.

£265 in Prizes

awarded to Students who gained 3 or more distinctions at the 1909 Preliminary Certificate Examination.

*** **Clough's Students have obtained far more distinctions than any other class or institution, both at the Preliminary Certificate and at the Certificate Examinations.**

For Prospectus, Syllabus, and full particulars of any of CLOUGH'S CLASSES (P.T., PRELIMINARY CERTIFICATE, MATRICULATION, CERTIFICATE, A.C.P., OXFORD and CAMBRIDGE Senior Locals, etc.), write at once to—

THE SECRETARY, Clough's Correspondence College, Temple Chambers, LONDON, E.C.

London and South-Western Railway.

SHORT HOLIDAY TRIPS
TO THE CONTINENT.

CYCLING TOURS in Normandy and Brittany, via Southampton.

Available for returning from Havre, Cherbourg, or St. Malo.

3 to 14 Days' Excursion Tickets

(Third Class Rail and Second Cabin Steamer) issued as follows:—

Available for 14 Days.

London to Havre, 24s. 6d., every Thursday.
Southampton to Havre, 20s., every Saturday.
London to Rouen, 1st Class, 38s.; 2nd Class, 28s. 6d. } Every
Southampton to Rouen, 1st Class, 33s. 6d.; 2nd Class, 26s. } Week
By Steamer only between Havre and Rouen. Day.
London to Caen, 27s. 9d., every Friday and Saturday.
Southampton to Caen, 23s. 3d., every Friday and Saturday.
London to Trouville, 25s. 6d., every Friday and Saturday.
Southampton to Trouville, 21s., every Friday and Saturday.
London to Etretat, 29s. 2d., every Friday and Saturday.
Southampton to Etretat, 24s. 8d., every Friday and Saturday.
London to St. Malo, for St. Servan, Dinard, Dinan, Mont St. Michel, etc., 24s. 6d., every Saturday.
Southampton to St. Malo, 20s., every Saturday.
London to Cherbourg, for Avranches, Coutances, etc., 23s. 6d., every Tuesday.
Southampton to Cherbourg, 17s., every Saturday.

Week-end Tickets.

London to Havre, 1st Class, 29s. 6d.; 2nd Class, 22s.
Southampton to Havre, 1st Class, 25s.; 2nd Class, 19s.

Issued every Friday, Saturday, and Monday, available for return up to and including Tuesday following date of issue.

14 Days' Excursion Tickets to Paris will be issued for August Bank Holiday.

*** For particulars of Sailings and all further information apply to Mr. H. HOLMES, Supt. of the Line, Waterloo Station, London, S.E., or to Mr. T. M. WILLIAMS, Docks and Marine Supt., Southampton.

The Company's Guide Book to Holiday Resorts in Normandy and Brittany sent free on application.

CHAS. J. OWENS, *General Manager.*

28 Years' Trading!

THE EDUCATIONAL MUSICAL INSTRUMENT COMPANY

(J. W. MORTON, Manager),

18 & 19 Highbury Place, LONDON, N.;
and 21 Argyle Crescent, PORTOBELLO, EDINBURGH.

MANY THOUSANDS of Teachers, School Managers, etc., including over **Thirty of H.M. Inspectors of Schools,** are using and recommending our Instruments, of which we have specimens **in every County of the British Isles.**

We pay carriage, give a month's free trial, a ten years' warranty, and **exchange free of cost** if the instrument sent is not all that is desired.

See our **45 Guinea** Prize Medal Upright Iron Grand Piano for **£21 cash,** or thirty-six payments of 13s. 5d. per month. Quite new, rich, full tone, and thoroughly durable.

CYCLES, CAMERAS, & FURNITURE
on special terms.

Dr. MACNAMARA, M.A., M.P., writes: "We are more than delighted with the Piano which you recently selected for and supplied to us. Any of my friends who need an instrument cannot possibly do better than place themselves entirely in your hands."

Mr. J. H. YOXALL, M.A., M.P., Gen. Sec. N.U.T., writes: "For the fourth time I have experienced, for myself or for relatives, the special value, wide selection, and expert advice which your clients gain. Each of the four Pianos has given perfect satisfaction."

Showrooms open daily. Write for our List, specifying the class preferred,

WE CAN SAVE YOU MANY POUNDS.

(Please mention this Paper.)

when learning to construct our Socialistic state—if that day ever arrives—we shall turn to Spencer to ascertain the importance of individual responsibility; for unless, in some way, individual responsibility find a place, and a large place, within collectivist schemes, they are not destined to endure. He was on the unpopular side even in his own day, and his cause wanes fainter and fainter. To-day the banner of individualism in English politics is borne by Mr. Harold Cox, member for Leicester; and, by a curious coincidence, Mr. Spencer, years ago, was invited to sit for the same town. He declined, as usual. Hs was offered honours by universities and learned societies; he declined them. He was offered monetary help; he declined it. "The greater or smaller amount of profit weighs with me but little" (page 164), he said on one occasion, in a business communication. Yet he was so poor at times that he thought his work must stop.

One further question I must try to answer in an article for the *Practical Teacher*. How was Spencer educated?

"From thirteen to sixteen," he says, "my acquirements were limited to Euclid, algebra, trigonometry, mechanics, and the first part of Newton's *Principia*. To this equipment I never added." He once learned Latin grammar; hated it at first, but liked it afterwards; never, however, knowing or loving the ancient classics. But I can scarcely go on. Readers will find an account of Mr. Spencer's intellectual equipment on pages 417 and 529. He shared with Hobbes the belief that much reading made for stupidity. But did he reflect (though he wrote a Psychology—the science was in its infancy in his day) that though great minds like his and Hobbes' may be able to evolve a system of knowledge for themselves by mere unaided observation of the world, yet lesser men cannot? For them systematic instruction is a sheer necessity; otherwise they do not merely not originate, they learn nothing.

Such of my readers as have been recently to university courses in philosophy will know that Spencer's ethics and metaphysics have never been accepted as valid by academically trained thinkers; the expert has always been against him, I fear not altogether without justice. But this also we need to remember—his stimulus to philosophic thought has been enormously powerful. Three at least of the younger English psychologists—men in whose hands lies the immediate future of British psychology—came to psychology and philosophy through Spencer. They do not now subscribe to many of his psychological doctrines, but they never forget that to him they owe the open gate, to him the vistas of the unknown fields beyond. He rests from his labours, but his work lives on in others: may they at least be not all unworthy of their great teacher.

THE NEW BOTANY.

A WELL-KNOWN writer defines education as that process by which the child is adapted to its environment, or to its future environment. Without discussing the appropriateness of the definition in pedagogy, but merely accepting it as a definition, then we may give a new definition of botany, and say that it is the science which deals with the "education of plants." Not long ago the theoretical part of botany consisted in memorising uncouth words derived from Greek roots, and which to the "botanist" described the forms and positions of the different parts of a plant; while the practical part was carried out by pulling flowers to pieces, and classifying the plants from which they had been gathered, according as one or other of these "botanical terms" was found to apply.

The modern botanist looks upon a plant as a living organism endowed with marvellous powers of adapting itself to circumstances, and by the exercise of these powers not only preserving its own life, but bequeathing to its descendants tendencies and characteristics which are of great value in the struggle for existence, and which tend to become fixed in the race.

A Text-book of Botany. By J. M. Lowson, M.A., B.Sc., F.L.S. (University Tutorial Press. 6s. 6d.)—This is a new and revised edition of a scholarly work with which many of our readers are familiar. The most important alteration is the addition of a chapter on the ecology and geographical distribution of plants. This brings the work quite up-to-date. The writer deals with what are called plant associations, and shows that moisture-loving plants will necessarily all be associated together in the same damp locality, while drought-loving plants will as naturally be found together in the dry spots. The subject of perennation, or the means by which plants are able to persist through long years, is next dealt with; and then the different "plant societies" are considered in turn, and fully illustrated by reference to British plants.

The book is very fully illustrated by well-drawn diagrams, in which the parts and their names are joined by straight lines, a plan which makes everything remarkably clear to the student. The subject matter treated is that prescribed by the London University Intermediate Science Syllabus, and the treatment is thoroughly sound and scientific.

Life Histories of Common Plants. By F. Cavers, D.Sc. (University Tutorial Press. 3s.)—The title of this excellent book does it scanty justice; it is really a text-book of experimental botany on modern lines. The first six chapters (181 pp.) give a very clear account of the life processes of plants in general. This is illustrated by simple experiments which the student can carry out for himself; while the book, in a most suggestive manner, leads him to appreciate what the experiments teach. The remaining fifteen chapters (174 pp.) deal with what we have described above as the "education" of particular plants, which should be familiar to every one who goes about the country with his eyes open. Dr. Cavers has not only presented the student with a store of most interesting information, but what is far more important still, he has shown him how to gather information for himself.

Essentials of Botany. By Joseph Y. Bergen, A.M. (Ginn and Company. 5s.)—This is a book of quite a different type from the two preceding. In dealing with the life history of plants, it deals more largely with work that can be carried on in a biological laboratory, and less with field botany. The descriptions and instructions for experimental work are splendid, and the illustrations, both diagrammatic and photographic, are as near perfection as the most modern printing-press can produce. At the same time, British elementary students will find a disadvantage in the frequent references to American plants—for example, hickory, buck-eye, four-o'clock seeds, jimson weed, boneset; and ragweed is apparently different from the familiar ragwort, and "pigweed" is evidently not the "shepherd's purse," a plant which is known by that name in Wiltshire. The chapters on cryptogams and on pollination are particularly good. While as a rule insects seem to be instrumental in fertilising flowers

LONDON UNIVERSITY EXAMINATIONS.

FREE GUIDE

To Matriculation, and Free Guides to Inter. Arts, Inter. Science, B.A., B.Sc., and Divinity.

POST FREE FROM THE SECRETARY, BURLINGTON HOUSE, CAMBRIDGE, or from the London Office of University Correspondence College, 32 Red Lion Square, Holborn, W.C.

'SWAN'

The TEACHERS' PEN.

Its system is simple and reliable, the holder is comfortable to the hand, the nib is 14-ct. gold, tipped with iridium; the pen starts to write immediately it touches the paper, and your favourite steel nib can be matched exactly in any "SWAN."

The recognised best of all Fountain Pens.

GOOD FOR YEARS OF HARD WORK.

Sold by all Stationers and Jewellers.

Prices from **10/6** upwards.

Write for Catalogue—

MABIE, TODD & CO.,

79 & 80 HIGH HOLBORN, LONDON, W.C.

Branches: 93 Cheapside, E.C.; 95 Regent Street, W.; 3 Exchange Street, MANCHESTER; 10 Rue Neuve, BRUSSELS; Brentano's, 37 Ave. de l'Opéra, PARIS; and at NEW YORK and CHICAGO.

USE Early in the Summer VACATION

(for best results—three times a year only)

FLORIGENE

(A Registered Name suggested by Floor—Hygiene)

UNEQUALLED ODOURLESS, or very powerful GERMICIDAL "Dust-Allayers"

On all School, Laboratory, Library, Museum, Studio, Office, and other Floors—either Wood, Linoleum, Stone, Concrete, or Polished, etc.—for the hygienic, economic, and anhydrous

LAYING of DUST

(As recommended in the Education Department Blue Book)

"Florigene" need only be applied three times a year, as each application lasts for two to six months, according to wear. The ordinary daily sweeping alone required to clean the floors—no scrubbing (*unless preferred*) or sprinkling of any kind—therefore no injurious moisture.

Awarded the Bronze Medal of the Royal Sanitary Institute

Send for particulars, **Bacteriological** *and other Reports, and Testimonials to*

The 'DUST-ALLAYER' Co.,

165 QUEEN VICTORIA ST., LONDON, E.C.

Contractors to Admiralty, War Office, H.M. Office of Works, etc.

in an accidental or unintentional manner, the small moth *Pronuba* seems to set about the business of fertilising the yucca as though it quite understood the process, and knew just what it was required to do to benefit the flower.

Plants and their Ways. By Ernest Evans. (Dent and Company.) In this book the writer begins with the structure of flowers, and, after dealing with seeds, he works out the life processes of growing plants. At every point experiments are described and practical work is set. There is, however, an indefiniteness about the instructions which detracts from their value in a scientific study. Thus, in dealing with the effect of temperature on the germination of seeds sown in two pots, it is not sufficient to say, "Keep one pot in a cold place and the other near a fire." Temperature is a measurable quantity, and the experiment should be arranged so as to discover the limits within which germination will go on, and the point at which it proceeds with maximum energy. The paragraph on "How to Identify Plants" (p. 158) is most disappointing: "The student should obtain a good British flora, and, when opportunities occur, plants should be collected, and by means of the structure of the plants their position in the vegetable kingdom should be obtained."

Elementary Botany. By E. Drabble, D.Sc., F.L.S. (Edward Arnold. 2s. 6d.)—The approach to the subject in this admirable little work is through physiology. After a brief introductory chapter, in which the writer sets out what is the fundamental nature of a plant, he goes on to explain the processes of photosynthesis and root absorption by which the plant obtains its food, and the composition of the latter is described. Then the bulk of the book is taken up with an account of the organs engaged in carrying out the life-processes. The book then gives an outline of the chief British orders. The illustrations are good, and the book is written in a nice clear style.

A First Book of Botany. By Elizabeth Healey. (Macmillan and Company. 1s. 6d.)—This little book is admirably arranged to cover a good year's work in the subject in a secondary school. As the writer points out in the preface, "The school year now usually begins in September," hence the opening chapters deal with seeds, because material for practical work is then most readily obtained. The æsthetic side of the subject is not overlooked, and school-girls will not obtain a less accurate knowledge of the structure and life history of plants by trying to remember the quotations which are introduced, and which show how the beauty of flowers has appealed to our greatest writers. The work is beautifully illustrated.

Nature Study. By J. R. Ainsworth Davis, M.A., F.C.P.—This is an excellent text-book of elementary biology, and it seems a pity that in *Nature Study* inanimate nature should be overlooked. The student of biology will gain much from this splendid book, which is beautifully illustrated and drawn up on a systematic plan in which special notice is taken of those organs which show the relation of the plants and animals described to other animals and plants. At the same time, we feel that Nature study should throw the student into more direct touch with Nature, and the information gained through books—interesting and important though it may be—concerning "Dogfishes and Sharks," "Termites," "Ancestral Molluscs," "Parasitic Worms," and the "Rhinoceros and Tapir" is not the material to be imparted to children under the name of Nature Study.

AN UNCONVENTIONAL HISTORY.

MR. MURRAY has just issued the third and fourth volumes of Mr. Fletcher's *Introductory History of England*, two handsome books which it is a pleasure to read, owing to the beautiful typography and tasteful setting of the page. Our readers will remember that Mr. Fletcher is the historian who calls a spade a spade—for example:—

"Dread of Popery made it dangerous to drink the toast (of 'Church and King') in the days of James the Second; but loyalty would probably have triumphed even if James had not added to his Popery the misfortune of being an immeasurable ass."

This clears the air. We have all thought it for long enough, but only Mr. Fletcher has dared to say it in print, and the colloquialism is much more refreshing than conventional English. But we trust that the small fry of historians will not imitate his manner.

The first of the two volumes before us deals with the period from the Restoration to the beginning of the Great War; and in almost every page we have new light shed upon familiar events, new connections forged in the chain of causation, new knowledge to break down old prejudices, while the whole is suffused by a quality which we should call humour if we were not in danger of being misunderstood, for the term is in many quarters synonymous with buffoonery. The scientific historian will stand aghast at the following—a ripe chestnut too:—

"A charming story current at the time (of the War of American Independence) may fittingly close the history of the thirteen colonies. Vergennes was entertaining at dinner on the night of the signature of the Treaty Mr. Richard Oswald and Mr. Benjamin Franklin, the plenipotentiaries for the respective Governments of Great Britain and America; and he, as in duty bound, proposed the health of his own sovereign, "Louis the Sixteenth, who, like the sun in heaven, illumines," etc. Finding the *rôle* of the sun occupied, Mr. Oswald, in proposing George the Third, could only compare him to the moon (who rules the tides and so rules the sea); whereupon Franklin rose—and one can forgive even Franklin much for it—and added, "And I give you the health of George Washington, who, like Joshua of old, said to the sun and to the moon, 'Stand ye still,' and they obeyed him."

Mr. Fletcher's second volume brings the national story down to 1815, after which history is politics and out of his province. We admire the daring which can conclude the work at such a date. Trafalgar and Waterloo dominate this concluding volume, which is fully as interesting and as stimulating as the others, as provocative of thought and determined opposition, and as delightfully unscientific. According to the modern historian, Mr. Fletcher has no conceivable right to air his personal opinions, no excuse for pointing the moral, nor for using history as a guide-post and danger signal for the future. But he does all these things in his concluding chapter; and we thank him for it, though we do not agree with him, for our prejudices do not happen to coincide with his own. The upper form boys who are brought up on his *Introductory* history—the descriptive term is really appropriate, though it suggests Little Arthur—will imbibe sane views, will learn the method of the knock-down blow which is the spice of life, and will become mentally virile without developing that self-opinion which burkes argument from sheer intellectual laziness and distrust of self.

NEXT MONTH.

An illustrated account of the historical play "Henry of Navarre."

BRITISH MUSEUM 20 JY 09

L. & C. Hardtmuth's
'KOH-I-NOOR' PENCILS

are made for those who want something better than the ordinary penny or twopenny pencil. The "Koh-I-Noor" is made by special processes. Its touch is the touch of velvet; it is even in grade; it contains no grit whatever; and it is so highly compressed that it will outlast *half a dozen* of the common kind. If you have never tried a "Koh-I-Noor," get one to-day.

For the rough work of school children, Hardtmuth's Penny School Pencils are the best value ever offered. Many other specialities for use in schools are also made.

"KOH-I-NOOR" Pencils are 4d. each, or 3s. 6d. per dozen. Of all Stationers.

Catalogue post free from

L. & C. HARDTMUTH,
12 Golden Lane,
London, E.C.

(Paris, Vienna, Dresden, Milan, Brussels, and New York.)

FRENCH PRONUNCIATION MADE EASY
By W. H. HEBERT.

Containing the Vowel Sounds, the Consonants, Accents and Signs, the Nasal, Division of Words into Syllables, Quantity, Rules on Proper Nouns, Reading Exercises with Interlined Phonetic Pronunciation, Key to the Reading Exercises. 4th Edition. Crown 8vo, green cloth, limp, **1s.**

ESPERANTO SELF-TAUGHT.
(Marlborough's SELF-TAUGHT Series.)
By WILLIAM W. MANN,

Member of the British Esperanto Association. Containing Vocabularies, Conversational Phrases and Sentences—Grammar—Commercial, Trading, Legal, and Religious Terms—Travel Talk—Photography—Cycling—Motoring—Amusements—Money, Weights and Measures, etc., etc., with Phonetic Pronunciation. Crown 8vo, red cloth, **1s. 6d.**; Blue Wrapper, **1s.**

Sold by all Booksellers and Bookstalls.
For complete list write for the (A) *Catalogue, post free.*
London: E. Marlborough & Co., Publishers, 51 Old Bailey, E.C.

16 PALL MALL EAST, LONDON, S.W.

THE
SCHOLARS' CARTOONS.

By WALTER CRANE, FRANK BRANGWYN, GERALD MOIRA, JOHN HASSALL, MOORE PARK, CAMPBELL TAYLOR, S. PRYSE.

The Only Pictures *suitable for Schoolroom Decoration, combining*

HISTORIC ACCURACY WITH ARTISTIC MERIT.

INSPECTORS, EDUCATION COMMITTEES, TEACHERS, unanimous in their praise.

PROSPECTUS GRATIS. Prints sent on approval.

An Illustrated Catalogue of other Educational Pictures in preparation.

J. POOLE & CO.

Established 1854.

104 Charing Cross Road,

LONDON, W.C.

ENQUIRIES BY LETTER RECEIVE IMMEDIATE ATTENTION.

SCIENTIFIC and EDUCATIONAL BOOKS,
New and Second-hand.

LARGEST STOCK IN LONDON
of Second-hand School, Classical, Mechanical, Elementary, and Advanced Scientific Books at about
HALF PUBLISHED PRICE.

Mathematical, Theological, and Foreign Books.

DELICIOUS COFFEE
RED WHITE & BLUE
FOR BREAKFAST & AFTER DINNER.
In making, use less quantity, it being so much stronger than ordinary COFFEE.

. . NELSON'S . .
SHILLING LIBRARY.

The Best Modern Copyright Works, other than fiction, in handsome Library Form. Cloth elegant, gilt top, 1/- net.

At all Booksellers and Bookstalls.

in an accidental or unintentional manner, the small moth *Pronuba* seems to set about the business of fertilising the yucca as though it quite understood the process, and knew just what it was required to do to benefit the flower.

Plants and their Ways. By Ernest Evans. (Dent and Company.) In this book the writer begins with the structure of flowers, and, after dealing with seeds, he works out the life processes of growing plants. At every point experiments are described and practical work is set. There is, however, an indefiniteness about the instructions which detracts from their value in a scientific study. Thus, in dealing with the effect of temperature on the germination of seeds sown in two pots, it is not sufficient to say, "Keep one pot in a cold place and the other near a fire." Temperature is a measurable quantity, and the experiment should be arranged so as to discover the limits within which germination will go on, and the point at which it proceeds with maximum energy. The paragraph on "How to Identify Plants" (p. 158) is most disappointing: "The student should obtain a good British flora, and, when opportunities occur, plants should be collected, and by means of the structure of the plants their position in the vegetable kingdom should be obtained."

Elementary Botany. By E. Drabble, D.Sc., F.L.S. (Edward Arnold. 2s. 6d.)—The approach to the subject in this admirable little work is through physiology. After a brief introductory chapter, in which the writer sets out what is the fundamental nature of a plant, he goes on to explain the processes of photosynthesis and root absorption by which the plant obtains its food, and the composition of the latter is described. Then the bulk of the book is taken up with an account of the organs engaged in carrying out the life-processes. The book then gives an outline of the chief British orders. The illustrations are good, and the book is written in a nice clear style.

A First Book of Botany. By Elizabeth Healey. (Macmillan and Company. 1s. 6d.)—This little book is admirably arranged to cover a good year's work in the subject in a secondary school. As the writer points out in the preface, "The school year now usually begins in September," hence the opening chapters deal with seeds, because material for practical work is then most readily obtained. The æsthetic side of the subject is not overlooked, and school-girls will not obtain a less accurate knowledge of the structure and life history of plants by trying to remember the quotations which are introduced, and which show how the beauty of flowers has appealed to our greatest writers. The work is beautifully illustrated.

Nature Study. By J. R. Ainsworth Davis, M.A., F.C.P.—This is an excellent text-book of elementary biology, and it seems a pity that in *Nature Study* inanimate nature should be overlooked. The student of biology will gain much from this splendid book, which is beautifully illustrated and drawn up on a systematic plan in which special notice is taken of those organs which show the relation of the plants and animals described to other animals and plants. At the same time, we feel that Nature study should throw the student into more direct touch with Nature, and the information gained through books—interesting and important though it may be—concerning "Dogfishes and Sharks," "Termites," "Ancestral Molluscs," "Parasitic Worms," and the "Rhinoceros and Tapir" is not the material to be imparted to children under the name of Nature Study.

AN UNCONVENTIONAL HISTORY.

MR. MURRAY has just issued the third and fourth volumes of Mr. Fletcher's *Introductory History of England*, two handsome books which it is a pleasure to read, owing to the beautiful typography and tasteful setting of the page. Our readers will remember that Mr. Fletcher is the historian who calls a spade a spade—for example:—

"Dread of Popery made it dangerous to drink the toast (of 'Church and King') in the days of James the Second; but loyalty would probably have triumphed even if James had not added to his Popery the misfortune of being an immeasurable ass."

This clears the air. We have all thought it for long enough, but only Mr. Fletcher has dared to say it in print, and the colloquialism is much more refreshing than conventional English. But we trust that the small fry of historians will not imitate his manner.

The first of the two volumes before us deals with the period from the Restoration to the beginning of the Great War; and in almost every page we have new light shed upon familiar events, new connections forged in the chain of causation, new knowledge to break down old prejudices, while the whole is suffused by a quality which we should call humour if we were not in danger of being misunderstood, for the term is in many quarters synonymous with buffoonery. The scientific historian will stand aghast at the following—a ripe chestnut too:—

"A charming story current at the time (of the War of American Independence) may fittingly close the history of the thirteen colonies. Vergennes was entertaining at dinner on the night of the signature of the Treaty Mr. Richard Oswald and Mr. Benjamin Franklin, the plenipotentiaries for the respective Governments of Great Britain and America; and he, as in duty bound, proposed the health of his own sovereign, "Louis the Sixteenth, who, like the sun in heaven, illumines," etc. Finding the *rôle* of the sun occupied, Mr. Oswald, in proposing George the Third, could only compare him to the moon (who rules the tides and so rules the sea); whereupon Franklin rose—and one can forgive even Franklin much for it—and added, "And I give you the health of George Washington, who, like Joshua of old, said to the sun and to the moon, 'Stand ye still,' and they obeyed him."

Mr. Fletcher's second volume brings the national story down to 1815, after which history is politics and out of his province. We admire the daring which can conclude the work at such a date. Trafalgar and Waterloo dominate this concluding volume, which is fully as interesting and as stimulating as the others, as provocative of thought and determined opposition, and as delightfully unscientific. According to the modern historian, Mr. Fletcher has no conceivable right to air his personal opinions, no excuse for pointing the moral, nor for using history as a guide-post and danger signal for the future. But he does all these things in his concluding chapter; and we thank him for it, though we do not agree with him, for our prejudices do not happen to coincide with his own. The upper form boys who are brought up on his *Introductory* history—the descriptive term is really appropriate, though it suggests Little Arthur—will imbibe sane views, will learn the method of the knock-down blow which is the spice of life, and will become mentally virile without developing that self-opinion which burkes argument from sheer intellectual laziness and distrust of self.

NEXT MONTH.

An illustrated account of the historical play "Henry of Navarre."

BRITISH MUSEUM 20 JY 09

L. & C. Hardtmuth's

'KOH-I-NOOR' PENCILS

are made for those who want something better than the ordinary penny or twopenny pencil. The "Koh-I-Noor" is made by special processes. Its touch is the touch of velvet; it is even in grade; it contains no grit whatever; and it is *so* highly compressed that it will outlast *half a dozen* of the common kind. If you have never tried a "Koh-I-Noor," get one to-day.

For the rough work of school children, Hardtmuth's Penny School Pencils are the best value ever offered. Many other specialities for use in schools are also made.

"KOH-I-NOOR" Pencils are 4d. each, or 3s. 6d. per dozen. Of all Stationers.

Catalogue post free from

L. & C. HARDTMUTH,
12 Golden Lane,
London, E.C.

(Paris, Vienna, Dresden, Milan, Brussels, and New York.)

FRENCH PRONUNCIATION MADE EASY

By W. H. HEBERT.

Containing the Vowel Sounds, the Consonants, Accents and Signs, the Nasal, Division of Words into Syllables, Quantity, Rules on Proper Nouns, Reading Exercises with Interlined Phonetic Pronunciation, Key to the Reading Exercises. 4th Edition. Crown 8vo, green cloth, limp, 1s.

ESPERANTO SELF-TAUGHT.

(Marlborough's SELF-TAUGHT Series.)

By WILLIAM W. MANN,

Member of the British Esperanto Association. Containing Vocabularies, Conversational Phrases and Sentences—Grammar—Commercial, Trading, Legal, and Religious Terms—Travel Talk—Photography—Cycling—Motoring—Amusements—Money, Weights and Measures, etc., etc., with Phonetic Pronunciation. Crown 8vo, red cloth, 1s. 6d.; Blue Wrapper, 1s.

Sold by all Booksellers and Bookstalls.

For complete list write for the (A) *Catalogue, post free.*

London: E. Marlborough & Co., Publishers, 51 Old Bailey, E.C.

16 PALL MALL EAST, LONDON, S.W.

THE SCHOLARS' CARTOONS.

By WALTER CRANE, FRANK BRANGWYN, GERALD MOIRA, JOHN HASSALL, MOORE PARK, CAMPBELL TAYLOR, S. PRYSE.

The Only Pictures suitable for Schoolroom Decoration, combining

HISTORIC ACCURACY WITH ARTISTIC MERIT.

INSPECTORS, EDUCATION COMMITTEES, TEACHERS, unanimous in their praise.

PROSPECTUS GRATIS. Prints sent on approval.

An Illustrated Catalogue of other Educational Pictures in preparation.

J. POOLE & CO.

Established 1854.

104 Charing Cross Road,

LONDON, W.C.

ENQUIRIES BY LETTER RECEIVE IMMEDIATE ATTENTION.

SCIENTIFIC and EDUCATIONAL BOOKS,

New and Second-hand.

LARGEST STOCK IN LONDON

of Second-hand School, Classical, Mechanical, Elementary, and Advanced Scientific Books at about

HALF PUBLISHED PRICE.

Mathematical, Theological, and Foreign Books.

DELICIOUS COFFEE

RED WHITE & BLUE

FOR BREAKFAST & AFTER DINNER.

In making, use less quantity, it being so much stronger than ordinary COFFEE.

. . NELSON'S . .

SHILLING LIBRARY.

The Best Modern Copyright Works, other than fiction, in handsome Library Form. Cloth elegant, gilt top, 1/- net.

At all Booksellers and Bookstalls.

CHARGES FOR ADVERTISEMENTS.

	£	s.	d.		£	s.	d.
Page (Ordinary)	5	5	0	Quarter Page	1	7	6
Back Page	6	6	0	One-eighth Page	0	15	0
Half Page	2	12	6	**** Special Terms for Series on application.			

THE PRACTICAL TEACHER is published on the 25th of each month. Advertisements should reach the Office not later than the 10th of the month.

THOMAS NELSON AND SONS, 35 and 36 Paternoster Row, London, E.C.

- NELSON'S -
SHILLING LIBRARY

Of Notable Copyright Books of Travel, History, Biography, and General Literature.

"Messrs. Nelson's latest enterprise deserves the enthusiastic support of those of the reading public who are interested in something outside sixpenny fiction."—*Daily News.*

NEW VOLUMES.

A BOOK ABOUT THE GARDEN .... Dean Hole.
CULTURE AND ANARCHY .... Matthew Arnold.

PREVIOUSLY ISSUED.

SCRAMBLES AMONGST THE ALPS .... Edward Whymper.
COLLECTIONS AND RECOLLECTIONS .... G. W. E. Russell.
THE GREAT BOER WAR .... A. Conan Doyle.
LIFE OF JOHN NICHOLSON .... Captain Trotter.
The man of destiny of our Indian Empire.
THE MEMORIES OF DEAN HOLE ....
THE PSALMS IN HUMAN LIFE .... R. E. Prothero.
No modern book on a religious subject has enjoyed a wider popularity than this.
WILD LIFE IN A SOUTHERN COUNTY .... R. Jefferies.
LIFE OF GLADSTONE .... Herbert W. Paul.
THE FOREST .... Stewart Edward White.
THE GOLDEN AGE .... Kenneth Grahame.
A classic of child-life which has had no rivals since "Alice in Wonderland."
SIMPLE ADVENTURES OF A MEMSAHIB .... Sara Jeannette Duncan.
As readable as any romance, and gives a genuine insight into the conditions of English and native life in India.
REMINISCENCES OF SIR HENRY HAWKINS ....
IDYLLS OF THE SEA .... Frank Bullen.
SELECTED ESSAYS .... Augustine Birrell.
LIFE OF LORD RUSSELL OF KILLOWEN .... R. Barry O'Brien.
MAKING OF MODERN EGYPT .... A. Colvin.
FROM THE CAPE TO CAIRO .... E. S. Grogan.
LIFE OF ALEXANDER HAMILTON .... F. S. Oliver.

On sale at all Booksellers and Bookstalls.

THOMAS NELSON AND SONS,
35 Paternoster Row, London, E.C.; Edinburgh, Dublin, and New York.

Many of the volumes have been thoroughly revised by a staff of competent revisers, and new features have been added.

Baddeley's Guides

("Thorough" Guide Series), Published by

THOMAS NELSON AND SONS

With Coloured Maps, Index Maps, Plans, Hotels, Tours, Etc. Bound in Limp Red Cloth. All at Net Prices.

I. **SCOTLAND, Part I.** "The Highlands" as far as Aberdeen, Inverness, and Stornoway, and including Edinburgh and Glasgow. **6s. 6d.** (Revised Edition.)

II. **SCOTLAND, Part II.** "Northern Highlands" from Aberdeen, Inverness, and Gairloch to Cape Wrath and "John o' Groat's." **3s. 6d.**

III. **SCOTLAND, Part III.** "The Lowlands," including Edinburgh and Glasgow. **4s.** (Revised Edition.)

IV. **ORKNEY and SHETLAND. 1s. 6d.** (Revised Edition.)

V. **IRELAND, Part I.** Northern Division, including Dublin. **4s.**

VI. **IRELAND, Part II.** Southern Division, including Dublin. **5s.**

VII. **ENGLISH LAKE DISTRICT. 5s.**

VIII. **YORKSHIRE, Part I.** East. **2s. 6d.**

IX. **YORKSHIRE, Part II.** West. **3s.** (The two in one Vol., **5s.**)

X. **THE PEAK DISTRICT OF DERBYSHIRE, Etc. 3s.** (Revised Edition.)

XI. **NORTH WALES, Part I.** Chester, Rhyl, Llandudno, Bangor, Llanrwst, Bettws-y-Coed, Carnarvon, Llanberis, Beddgelert, Ffestiniog Sections and Pwllheli. **3s.**

XII. **NORTH WALES, Part II.** Llangollen, Bala, Dolgelly, Barmouth, Shrewsbury, Machynlleth, Aberystwyth Sections. **2s. 6d.** (The two in one Vol., **5s.**)

XIII. **SOUTH WALES** and the Wye District of Monmouthshire. **3s. 6d.** (Revised Edition.)

XIV. **THE EASTERN COUNTIES** (Watering Places, Cathedral Cities, Etc.). **3s. 6d.**

XV. **SURREY and SUSSEX,** including Tunbridge Wells. **3s. 6d.**

XVI. **ISLE OF WIGHT. 2s. 6d.**

XVII. **NORTH DEVON AND NORTH CORNWALL,** with a full description of Exmoor and the Scilly Isles. **3s. 6d.**

XVIII. **SOUTH DEVON AND SOUTH CORNWALL,** with a full description of Dartmoor and the Scilly Isles. **4s.** (Revised Edition.)

XIX. **BATH and BRISTOL** and 40 miles round. **5s.** (Revised Edition.)

XX. **SOUTH HAMPSHIRE and SOUTH DORSET,** including the New Forest. This completes Baddeley's Guides to the South Coast of England. **3s. 6d.**

PRICE **6D** NET.

Nelson's Guides

PRICE **6D** NET.

A Series of Cheap Guide Books to the Chief Holiday Resorts of England and Wales.

The volumes contain an average of 60 pages of letterpress, a large map of the district in three colours, several smaller maps and plans, and a number of fine illustrations. The type is large, and has been specially chosen for its clearness, since the Publishers feel that the typography of many cheap guide books is unnecessarily trying to the eyes. The volumes are bound in strong art linen, with an attractive cover design.

I. **BRIGHTON, HOVE, and WORTHING.**

II. **HASTINGS to BEXHILL** (including Battle, St. Leonards, and Rye).

III. **PLYMOUTH and DEVONPORT.**

IV. **FALMOUTH and the LIZARD.**

V. **SIDMOUTH to TORQUAY** (including Exeter, Dawlish, and Teignmouth).

VI. **ILFRACOMBE, LYNTON, and LYNMOUTH.**

VII. **SCARBOROUGH, BRIDLINGTON, & WHITBY.**

VIII. **YORK.**

IX. **LLANDUDNO** and the Coast.

X. **BETTWS-Y-COED and SNOWDON.**

XI. **The WYE VALLEY.**

XII. **ABERYSTWYTH** and Neighbourhood.

XIII. **PARIS.** (Price **9d.** net.)

Nelson's GUIDE TO LONDON, in French. 1s. net.

T. NELSON & SONS, 35 and 36 Paternoster Row, London, E.C.;

EDINBURGH, DUBLIN, AND NEW YORK.

BOOKS FOR HOLIDAY READING.

Nelson's Library.

7D. Net.

Issued 1st and 3rd Wednesdays of each month.
The Best Copyright Works of the Best Living Novelists.

LARGE TYPE. FINE PAPER. CLOTH EXTRA. GILT BACK.

7D. Net.

NEW VOLUMES.

Lady Rose's Daughter. *Mrs. Humphry Ward.*
Romance. *J. Conrad.*

PREVIOUSLY ISSUED.

The Primrose Path. *Mrs. Oliphant.*
Thompson's Progress. *C. J. Cutcliffe Hyne.*
The Lonely Lady of Grosvenor Square. *Mrs. H. de la Pasture.*
Love and Mr. Lewisham. *H. G. Wells.*
Clarissa Furiosa. *W. E. Norris.*
Cynthia's Way. *Mrs. A. Sidgwick.*
Raffles. *E. W. Hornung.*
The Food of the Gods. *H. G. Wells.*
French Nan. *A. and E. Castle.*
Springtime. *H. C. Bailey.*
Moonfleet. *J. Meade Falkner.*
Kipps. *H. G. Wells.*
The Gateless Barrier. *Lucas Malet.*
Major Vigoureux. *"Q."*
Old Gorgon Graham. *G. H. Lorimer.*
Mrs. Galer's Business. *W. Pett Ridge.*
House with the Green Shutters. *George Douglas.*
Selah Harrison. *S. Macnaughtan.*
Marcella. *Mrs. Humphry Ward.*
His Honor and a Lady. *Sara Jeannette Duncan (Mrs. Cotes).*
The Duenna of a Genius. *M. E. Francis.*
Owd Bob. *Alfred Ollivant.*
Eight Days. *R. E. Forrest.*
Lady Audley's Secret. *Miss Braddon.*
The Wages of Sin. *Lucas Malet.*
An Adventurer of the North. *Sir Gilbert Parker.*
The Pit. *Frank Norris.*
Woodside Farm. *Mrs. W. K. Clifford.*
Beaucaire, and The Beautiful Lady. *Booth Tarkington.*
The Recipe for Diamonds. *C. J. Cutcliffe Hyne.*
A Lame Dog's Diary. *S. Macnaughtan.*
The Man from America. *Mrs. H. de la Pasture.*
Sir John Constantine. *"Q."*
The Princess Passes. *C. N. & A. M. Williamson.*
White Fang. *Jack London.*
The Octopus. *Frank Norris.*
Translation of a Savage. *Sir Gilbert Parker.*
Matthew Austin. *W. E. Norris.*
The Odd Women. *George Gissing.*
The Lady of the Barge. *W. W. Jacobs.*
The God in the Car. *Anthony Hope.*
The Hosts of the Lord. *Mrs. Flora Annie Steel.*
His Grace. *W. E. Norris.*
The American Prisoner. *Eden Phillpotts.*
If Youth but Knew. *A. & E. Castle.*
Clementina. *A. E. W. Mason.*
John Charity. *H. A. Vachell.*
The King's Mirror. *Anthony Hope.*
David Grieve. *Mrs. Humphry Ward.*
Incomparable Bellairs. *Egerton Castle.*
Quisanté. *Anthony Hope.*
No. 5 John Street. *Richard Whiteing.*
Robert Elsmere. *Mrs. Humphry Ward.*
The Battle of the Strong. *Sir Gilbert Parker.*
Fortune of Christina M'Nab. *S. Macnaughtan.*
The Intrusions of Peggy. *Anthony Hope.*
Marriage of William Ashe. *Mrs. Humphry Ward.*

ON SALE AT ALL BOOKSELLERS AND BOOKSTALLS.

THOMAS NELSON & SONS, London, Edinburgh, Dublin, and New York.

COUPON
PRACTICAL TEACHER
August 1909

PRINTED AND PUBLISHED BY THOMAS NELSON & SONS, PROPRIETORS, AT THE OFFICE OF "THE PRACTICAL TEACHER," 35 & 36 PATERNOSTER ROW, LONDON, E.C.